

## RESEARCH ARTICLE

# A Uniform Conspiracy Mindset or Differentiated Reactions to Specific Conspiracy Beliefs? Evidence From Latent Profile Analyses

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Conspiracy theories arise for virtually any public event (e.g., pandemics, assassinations, disasters). In light of positively correlated endorsements of such beliefs, many have pointed to a more general mindset behind this. Others have argued against this notion of a consistent mindset. Applying Latent Profile Analyses, we examine the evidence for either uniform or differentiated response patterns to various items in five studies (reanalyzed datasets, total  $N = 7877$ ). Overall, the results speak strongly to uniform reactions that could be summarized as a general mindset, but also revealed important qualifications. First, small parts of the samples show more differentiated patterns in relation to extraterrestrial cover-up narratives (*Studies 2 to 4*) or contradictory theories (*Study 5*). Second, indicators dealing with the general suppression of relevant information in the public were among the items with the highest approval ratings across all classes. One discussed implication is that existing scales are useful tools to measure conspiracy mindsets. Another implication is that the average endorsement of any conspiracy theory is a function of both the respondents' conspiracy mindset and the item's psychometric difficulty, strongly suggesting interpreting item endorsement only in relative terms, but refraining from interpreting a high agreement as an absolute number.

**Keywords:** Latent profile analysis; conspiracy theories; conspiracy mindset; monological belief system; conspiracy mentality; conspiracy scales

For a long time, conspiracy theories have received relatively little scholarly attention in psychology or political science but seemed like eccentric quirks of only a few. Since increased visibility of conspiracy beliefs around 9/11, election fraud, and most recently the COVID-19 pandemic in 2020 (e.g., the concerted spread of *#filmyourhospital*, Gruzd & Mai, 2020), this has drastically changed. At first glance, these different conspiracy beliefs appear to be diverse regarding the range of topics covered (e.g., terrorism, democratic processes, health crises), the political orientations endorsing them (e.g., blaming the Republican Bush administration for the 9/11 inside job vs. blaming Democrats to 'steal' the US-election in 2020) as well as their likelihood from scientific perspectives. Some narratives are proven to be very unlikely (Grimes, 2016) while others are more plausible and connected to rational skepticism (Stojanov & Halberstadt, 2019).

A closer look, however, reveals shared principles: Conspiracy theories (defined as 'attempts to explain the ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors', Douglas et al., 2019, p. 4) express

per definition inter alia mistrust in authorities and powerful groups and the motivation to find explanations (for a critical discussion of the assumption that conspiracy theories only target powerful actors, see Nera et al., 2021). Consequently, research elaborated the empirical commonality that people who believe in one conspiracy also tend to believe in others (Goertzel, 1994) raising the question if this finding can be attributed to a homogenous construct such as a generalized political attitude (Imhoff & Bruder, 2014) or a monological belief system (Goertzel, 1994). But the existence of a general mindset remains a controversial issue including calls for a more differentiated perspective (Hagen, 2020; Pierre, 2020; Sutton & Douglas, 2020b). The aim of the present studies is to provide further empirical evidence addressing the question of consistency of conspiracism by examining latent response profiles of participants.

## The Conspiracy Mindset

The assumption of a general mindset relies basically on the robust empirical evidence that conspiracy items are substantially intercorrelated (Goertzel, 1994; Swami et al., 2010; Swami et al., 2011), even when the narratives are contradictory (Miller, 2020; Wood et al., 2012). It suggests that the degree of agreement on various items has common grounds explaining the connections; e.g., as a

general tendency to believe in conspiracy theories (Bruder et al., 2013; Goertzel, 1994). The general mindset does not represent a dichotomous system of believers and non-believers but is considered as a continuous construct with grey shapes in-between. A bundle of scales measure this construct as an internally consistent mindset, labelled *conspiracy mentality* (Imhoff & Bruder, 2014; concept originally developed by Moscovici, 1987; Stojanov & Halberstadt, 2019), *generic conspiracist beliefs* (Brotherton et al., 2013), or *general conspiracy belief* (Lantian et al., 2016). Other surveys avoid abstract generalization by quantifying beliefs in *specific* conspiracy narratives (e.g. Swami et al., 2011), but nevertheless treat conspiracy beliefs as a measurable, internally consistent response pattern.

Two further approaches are in accordance with the general mindset proposition but highlight the origin of the consistent responses. From a need-based perspective (Douglas et al., 2017), people adopt conspiracy beliefs as they hold the promise of satisfying their epistemic (e.g., reducing uncertainty), existential (e.g., feeling in control), and social needs (e.g., feeling uniquely special). To the extent that different conspiracy beliefs are equally potent in satisfying these needs, it follows that their content is more or less interchangeable and their endorsement just the expression of a deeper need.

From a cognitive perspective (Brotherton & French, 2014; Lantian et al., 2021; Pennycook et al., 2015; Swami et al., 2014), people endorse conspiracy beliefs because similar cognitive mechanisms, biases, heuristics, and thinking dispositions are applied when judging the plausibility of different narratives. Higher endorsement of conspiracy theories is associated with more intuitive thinking and preferences for simpler solutions, whereas analytic thinking can reduce the endorsement. The general cognitive thinking style presumably results in consistent endorsement of virtually any conspiracy belief as well.

Goertzel (1994) goes beyond the perspective of a generalized mindset and adds that conspiracy theories could be part of a *monological* belief system, implying far-reaching assumptions. Beliefs 'speak to themselves' (p. 740) and support each other in a closed, self-supporting system according to this approach. However, the work clarifies that this is not valid for all conspiracies and that *dialogical* conspiracy thinking open to factual evidence could exist as well.

### Criticism on the Belief System and Mindset Perspective

Although some studies adapted the term *monological* (Miller, 2020; Swami et al., 2011), it has also been criticized. The core assumption of a *closed epistemology* implying internal belief validation without considering external data is challenged by the fact that many parallel endorsed narratives fail to support but contradict each other (Sutton & Douglas, 2014). Additionally, people in conspiracy-related forums and milieus differ in terms of diverse topics and worldviews (Franks et al., 2017; Klein et al., 2018).

The second *nomothetic* factor of the monological framework concludes that world events are explained in a generalized way, often by malign patterns (Sutton

& Douglas, 2014). The less preconditioned concept of a conspiracy mindset without monological underpinnings refers to this generalized structure as well. Criticism on the mindset proposition argues that the underlying causal structure of different correlates is not clear yet, leaving open the function of the mindset to describe or to explain the findings (Sutton & Douglas, 2014, 2020b). Furthermore, some conspiracy narratives are shared by opposite political extremes questioning the political and ideological character of the mindset (Sutton & Douglas, 2020b). From a need-based perspective, it is also highly plausible that not all conspiracy beliefs are equally potent to satisfy all needs to the same degree. This is particularly true for social needs, like deflecting criticism from a valued ingroup by blaming their shortcoming on the evil actions of outgroup conspirators (Cichocka et al., 2016). Clearly, the same defense of the ingroup could not be achieved by endorsing the conspiracy belief that the moon landing was faked. Additionally, other specific factors such as epistemic mistrust could also cover distinct facets of conspiracy beliefs because the belief in one conspiracy does not predict the belief in all conspiracy theories (Pierre, 2020). The next section highlights the methodological caveats behind the mindset assumption.

### Method-Related Uncertainties

Previous claims about generalized response patterns rely on *variable-centered* methods like correlations and factor analyses. However, the primary purpose of these statistical methods is to explore the dimensionality of latent variables behind manifest items (factor analysis) or the strength of linear relations between items (intercorrelations). Although the underlying calculations are based on individual responses of participants, conclusions about general response patterns are only indirectly possible. While intercorrelations can be applied adequately to other research questions (e.g., the association between psychological constructs), they represent an information loss for describing individual response patterns (i.e., the return of a single value for all individuals). Furthermore, intercorrelations between conspiracy narratives still leave substantial, unexplained variance open as the range is typically between  $r = 0.03$ – $0.78$  (Goertzel, 1994) or  $r = 0.11$ – $0.63$  (Miller, 2020) and for contradictory conspiracy items  $r = 0.24$  (Wood et al., 2012) or  $r = 0.51$  (Imhoff & Lamberty, 2020). In a nutshell, previously applied variable-centered methods have been used to address general response patterns on *person* levels but actually made statements about variables and might, therefore, have missed important differentiated structures (Bogat et al., 2005).

*Person-centered* methods are recommended in these cases, offering more fine-grained analyses than variable-centered approaches (Hagenaars & Halman, 1989; Howard & Hoffman, 2018; Scotto Rosato & Baer, 2012), meeting the claim to pay more attention on heterogeneity of conspiracy theories (Pierre, 2020). *Latent Profile Analysis* (LPA) is a person-oriented method focusing on similarities of individuals, whereas the complementary factor analysis is a variable-centered technique describing the associations among variables (Masyn, 2013). The LPA is a mostly

descriptive and exploratory modeling approach to subdivide all participants into homogeneous classes (*typologies*) that are not directly observable, hence *latent* (Flaherty & Kiff, 2012). The model procedure employs probability functions and maximum likelihood estimations to categorize participants into their most likely class based on the response pattern on a set of manifest indicator items.

To make this more explicatory, let us illustrate the shortcoming of a variable-centered approach and the benefit of a person-centered approach with an example. Positive youth development scales measure the characteristics of a positive youth development, subdivided by factor analysis into internally consistent subscales (Sieng et al., 2018). The 'contribution' subscale, for example, appears to suggest a uniform factor ( $\alpha = 0.86$ , factor loadings  $>0.66$ ), but the analysis of latent classes reveals more diverse latent structures within the subscale (Nylund-Gibson & Choi, 2018). Arguably, LPA has its major potential in uncovering differentiated response patterns hidden by indices of variable-centered approaches. The differentiation of participants is important as it can have different implications, e.g., for the treatment of patients in the clinical segment (Cloitre et al., 2013; Herman et al., 2007). At the same time, it can also uncover patterns of uniform responses.

### Uniformity vs. Differentiation

Plotting the estimated responses of the LPA per each item and class in a single plot reveals the structure of the profile patterns. Although variable-centered methods might suggest highly consistent and uni-factorial structures, it could be that correlations driving this consistency are the result of large segments scoring very low on all vs. scoring comparatively higher on all items. A closer look at the response patterns, however, might expose that one high-scoring group is particularly strongly characterized by item A and comparatively less by item B, whereas another high-scoring group has an opposite pattern. Thus, their lines of average responses for these items cross. Likely, this difference—lost in variable-centered aggregation—would be meaningful for the consistency assumption.

In case of substantial crossings between class-lines, one would assume a differentiated response pattern, whereas almost parallel class-lines would demonstrate uniform responses across profiles. Concerning the conspiracy topic, the profiles can demonstrate if it is indeed a valid assumption to treat the measured conspiracy construct as a consistent mindset. We contribute to the issues and uncertainties behind the generalized mindset with a data-driven and person-oriented approach.

### The Present Studies

Our five studies examine the assumption of consistency underlying the conspiracy mindset by applying LPA. The analyses address the research question if response patterns of a variety of conspiracy-related items are uniform or differentiated. If latent classes in the LPA are uniform, then the estimated means over the indicator items of each class profile should follow a similar pattern and the lines should run almost in parallel. On the contrary, substantial crossings would indicate differentiated responses. Some

people might be particularly invested by antisemitic conspiracy beliefs, whereas others hold beliefs about a faked moon landing. Uniform patterns would speak in favor of a general mindset, whereas differentiated views would challenge the usefulness and validity of a general mindset construct.

The LPA illuminates this question from a different perspective by focusing on classes of participants instead of correlational analyses of items. It also allows to consider more fine-grained systematic differentiations in the responses. Importantly, our focus is not on characterizing specific classes (e.g., by describing them on third variables), but on the general pattern (a differentiated pattern of crossing lines vs. a uniform pattern of parallel lines).

We reanalyzed five large datasets containing conspiracy-related items that have been collected for other (published) studies. Studies 1–3 consist of scales measuring conspiracy mentality or beliefs in conspiracy theories. The large dataset used in Study 4 contains a multitude of items covering different conspiracy topics varying from general to specific content. The last study is composed of a dataset with measures of two contradictory beliefs about the COVID-19 pandemic (hoax vs. bioweapon). The research hypothesis for all studies is that the latent classes mirror a consistent and uniform response pattern that represents a necessary prerequisite of the general mindset approach.

### Study 1

The first study is a rather light test to the uniformity hypothesis, as the used *conspiracy mentality scale* (Imhoff & Bruder, 2014) is designed to measure a consistent construct. However, the variable-centered approach, with a medium average item-intercorrelation ( $r_{\text{mean}} = 0.43$ ) of the scale in the present dataset, may still shape more differentiated latent structures. If latent classes mirror a general mindset, then the estimated means over the items of each class profile should follow a similar pattern.

### Method

#### Participants

A yet unpublished dataset of German students ( $N = 508$ ; 413 females, 92 males and 3 diverse/no info;  $M_{\text{age}} = 24.27$ ,  $SD_{\text{age}} = 5.34$ ) formed the data basis for LPA. Another merged datasets of two publicly available datasets (Imhoff & Bruder, 2014; Imhoff & Lamberty, 2018) served for additional control calculations. Participants of the merged dataset were recruited in the US via *Mturk* (total  $N = 869$ ; 429 females, 422 males, 18 diverse/no info;  $M_{\text{age}} = 35.52$ ,  $SD_{\text{age}} = 12.33$ ). 824 participants remained in the sample after exclusions due to incomplete datasets or random clicking (when only maximum values of the items were selected, even on inversed coded items). Both datasets were collected in online surveys.

#### Latent Profile Analysis

The 12 items of the conspiracy mentality scale (Imhoff & Bruder, 2014), rated on a seven-point Likert scale ('Strongly disagree' to 'Strongly agree'), were the manifest indicators for the analysis (e.g., 'Those at the top do whatever they want. '; items in the *Appendix*). Both inverted items

of the scale were recoded before the analysis. The LPA was conducted in *MPlus* (version 7.3; Muthén & Muthén) with 1000 unique starting values, of which the best 250 were selected for 500 iterations of maximum likelihood estimations with robust standard errors. According to the default and most common LPA procedure (Spurk et al., 2020), variances were constrained to be equal across classes and covariances were fixed to zero. The procedure was repeated for one to eight profile models.

To select the model with the optimal number of profiles, the *information criteria* indices Bayesian Information Criterion (BIC, Schwarz, 1978), Approximate Weight of Evidence (AWE, Banfield & Raftery, 1993) and Integrated Complete likelihood ( $ICL_{BIC}$ , Biernacki et al., 2010) were calculated. A common recommendation is to select the model with the lowest information criteria values as it represents a compromise between the best fitting and most parsimonious model. The *relative fit* criteria Bayes factor (BF, calculation from Masyn, 2013), Lo-Mendell-Rubin likelihood-ratio test (LMR-LRT, Lo et al., 2001) and Bootstrap likelihood-ratio test (BLRT, McLachlan & Peel, 2000) compare the given model with the bordering model and indicate via *p*-values (respectively Bayes factors) the significance of improvement of one model over the other. As the BLRT never reached a non-significant *p*-value in any of the analyzed studies, it is not presented in the tables. To maximize the chances to uncover differentiated patterns, we chose the model with a higher number of classes when the class enumeration did not yield a clear model preference in any of the presented studies. This allowed maximally fine-grained analyses without losing specific response patterns.

Further diagnostics are provided to indicate the precision of classification: The *Entropy* is an index to evaluate the overall precision of classification, with values  $>0.80$  indicating a good classification of individual cases into classes (Nylund-Gibson & Choi, 2018). *Average estimated posterior class probabilities* (AveP) determine the mean probabilities per class of being in each of the latent classes according to model estimations (Masyn, 2013). We report the average probability of the class with the lowest value ( $AveP_{min}$ ).

## Results

The absolute and relative criteria (**Table 1**) suggest selecting a solution with four or five classes. According to the aim of more fine-grained analyses and due to the evidence that the BIC is considered as particularly reliable (Nylund et al., 2007), the five-class model is preferred. The indices Entropy = 0.85 and  $AveP_{min} = 0.84$  point at a good classification of the model. The profiles in **Figure 1** demonstrate a uniform response pattern of conspiracy mentality without substantial crossings of the profile lines. The classes have significantly different conspiracy mentality mean scores,  $F(4, 503) = 855.98$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.872$  (all post-hoc tests significant in the expected directions, see <https://osf.io/grz6k/>). Applying a model with the same number of profiles to the more diverse *Mturk* dataset yielded highly similar profile patterns, and hence identical conclusions (see <https://osf.io/grz6k/>).

## Discussion

The conspiracy mentality measured with general items can be described as a consistent construct. The relative profile positions mirror the degree of the mean conspiracy mentality without deviating, hidden structures. Participants of a class with high ratings on one item also rate other items higher than participants from other classes. Although these data speak strongly for the consistency hypothesis, it should be noted that the employed scale was developed as a scale of a consistent mindset without naming concrete events or conspirators. We thus sought to replicate the analyses with a more concrete scale to subject the consistency hypothesis to a more critical test.

## Study 2

The scale *Generic belief in conspiracy theories* (GBCT; Brotherton et al., 2013) was originally developed as a multidimensional inventory including five sub-facets. The items are not event-based but still formulated much more specifically compared to the mentality questionnaire (e.g., ‘The spread of certain viruses and/or diseases is the result of deliberate, concealed efforts of some

**Table 1:** Model fit statistics of the student sample from Study 1 for latent profile analyses with 1–8 profile solutions.

#	n	LL	BIC	AWE	$ICL_{BIC}$	$BF_{k, k+1}$	$LMR-LRT_{p-value, k, k-1}$	Entropy
1	24	-8637.83	17425.18	17477.53	17425.18	<0.01	–	–
2	37	-7723.11	15676.75	15757.46	15609.85	<0.01	<0.001	0.905
3	50	-7498.92	15309.37	15418.43	15159.80	<0.01	0.048	0.866
4	63	-7332.82	15058.16	<b>15195.57</b>	14897.59	<0.01	0.001	0.886
5	76	-7284.50	<b>15042.51</b>	15208.28	14797.23	<b>5.42</b>	<b>0.158</b>	0.85
6	89	-7245.69	15045.89	15240.02	14796.49	<b>26662.14</b>	<b>0.438</b>	0.863
7	102	-7215.38	15066.27	15288.76	14781.57	<b>5866.42</b>	<b>0.757</b>	0.856
8	115	-7183.56	15083.62	15334.47	14739.25	–	<b>0.291</b>	0.837

Note: n = number of estimated parameters, LL = log-likelihood value,  $BF_{k, k+1}$  = evidence for given model k compared to the k+1 model,  $LMR-LRT_{p-val, k, k-1}$  = testing model k against model k-1.

organizations.’). The multidimensionality and increased specificity of these items put the consistency hypothesis to a more conservative test in the LPA, although the average item intercorrelations in the present dataset are relatively high ( $r_{\text{mean}} = 0.51$ ).

**Method**

**Participants**

The data were collected and reported by Swami et al. (2017) using an online *Mturk* sample from the U.S. ( $N = 803$ ; 448 females, 355 males;  $M_{\text{age}} = 37.07$ ,  $SD_{\text{age}} = 11.93$ ) with predominantly White participants. We applied no exclusion criteria to the dataset.

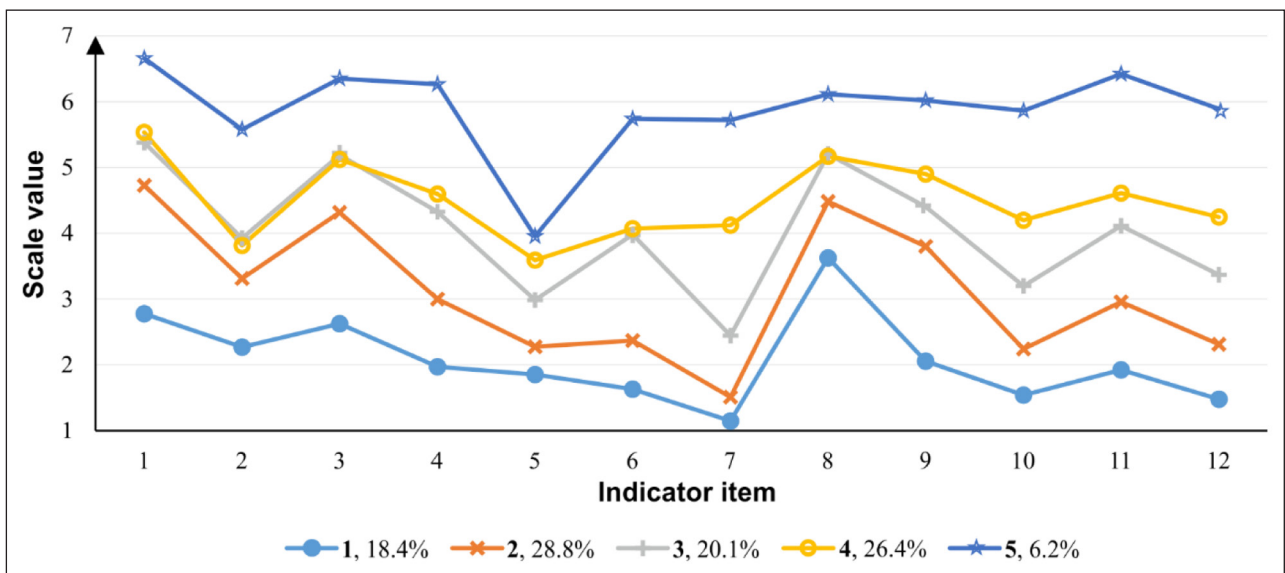
**Latent Profile Analysis**

The 15-items of the GCBS (see *Appendix*) were rated on a five-point Likert scale (‘Definitely not true’ to ‘Definitely true’) and represented the manifest indicator items for the LPA. All analysis steps for the eight models consisting of one to eight profile classes and calculations of fit criteria described in *Study 1* were conducted in this study as well.

**Results**

Based on evidence for the suitability of likelihood ratio tests (LRT) for class and profile model selection (Tein et al., 2013; Tofghi & Enders, 2008), we grounded our decision on this indicator’s clear recommendation of one model. The adopted five-profiles solution (**Table 2**) exhibited satisfactory classification diagnostics (Entropy = 0.91,  $\text{AveP}_{\text{min}} = 0.91$ ).

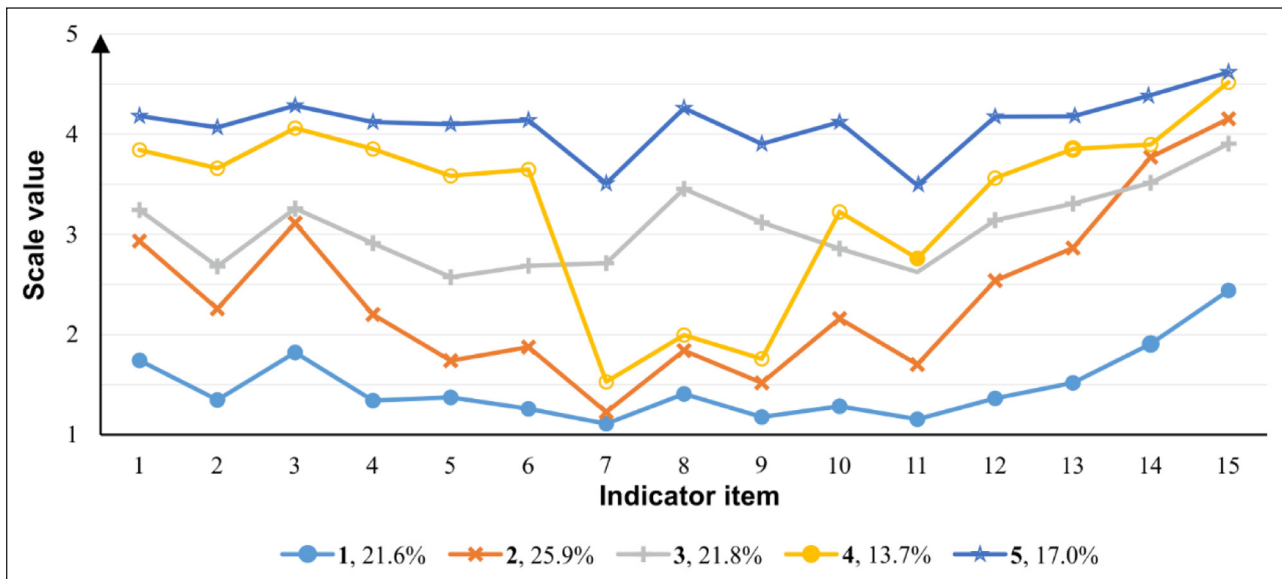
The profile patterns (**Figure 2**) were overall uniform and, therefore, supporting the research hypothesis. The classes have significantly differing, ascending GCBS mean scores,  $F(4, 798) = 1531.01$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.885$  (all post-hoc tests significant, see <https://osf.io/grz6k/>). The noteworthy exception breaking out of the consistency rule is the fourth class: It has generally high scores for all items except for those covering the topic of extraterrestrial cover-ups (7–9). Additionally, the items 14 and 15 about important information being concealed from the public seem to receive relatively high support in all classes, resulting in an order exchange of classes two and three. But standardized mean differences (item 14:  $d = 0.28$ , item 15:  $d = 0.31$ ) are considered as small for LPA and indicate



**Figure 1:** Estimated mean profiles of *Study 1*. The relative position across classes of the estimated means is overall consistent (response range between 1 and 7).

**Table 2:** Model fit statistics from *Study 2* for latent profile analyses with 1–8 profile solutions.

#	n	LL	BIC	AWE	ICL <sub>BIC</sub>	BF <sub>k, k+1</sub>	LMR-LRT <sub>p-value, k, k-1</sub>	Entropy
1	30	-17083.61	34367.87	34431.50	34367.87	<0.01	–	–
2	46	-14756.63	29820.92	29918.49	29753.01	<0.01	<0.001	0.939
3	62	-14035.42	28485.52	28617.02	28326.72	<0.01	<b>0.074</b>	0.91
4	78	-13715.11	27951.91	28117.35	27715.91	<0.01	<b>0.101</b>	0.894
5	94	-13445.93	27520.57	27719.95	27280.18	<0.01	<0.001	0.907
6	110	-13267.10	27269.92	27503.24	26982.16	<0.01	<b>0.344</b>	0.9
7	126	-13150.78	27144.30	27411.55	26850.54	<0.01	<b>0.118</b>	0.906
8	142	-13031.10	27011.94	27313.13	26711.37	–	<b>0.598</b>	0.91



**Figure 2:** Estimated mean profiles of *Study 2*. The response pattern is overall consistent despite the middle classes on the items covering extraterrestrial topics (7–9). The response values ranged from 1 to 5.

a large overlap (>50%) of both class distributions on these items (Masyn, 2013).

### Discussion

The LPA of the GCBS inventory yielded evidence in favor of the consistency hypothesis of the conspiracy mindset. The mean ratings of classes are overall consistent over items. Importantly, this conclusion is not valid for one of the classes when it comes to the topic of extraterrestrial cover-ups, where high turned into low approval ratings. This result sheds light on the possible limitations of mere intercorrelations and factor analyses in understanding the endorsement of specific conspiracy beliefs. The relatively high intercorrelations do not mirror or locate possible deviations. Although the variable-centered factor analysis suggested an extraterrestrial factor as well (Swami et al., 2017), it does not allow conclusions as to how the factor contributes differentially to the mindset. Items might measure the same factor, but do they also mirror systematic differences in the response patterns of the participants? The LPA located differentiations in this case only in a medium profile and uniform patterns in all other profiles. The results demonstrate that the extraction of different dimensions may sometimes be triggered only by a small group of participants in a specific segment that cannot be generalized to the whole sample.

Nevertheless, even with more specific items on conspiracy beliefs, we observed largely consistent class profiles. The next study pushed this test a bit further by looking at a scale that consists of highly specific conspiracy beliefs.

### Study 3

The most critical test to the consistency assumption among the mindset scales is the LPA of the *Belief in Conspiracy Theory Inventory* (BCTI; Swami et al., 2011). It measures the agreement to concrete, independent conspiracy theories involving different countries, institutions, events, and actors. If people indeed have differing takes

on different conspiracy propositions, this should show in their responses to these diverse statements. In line with the consistency hypothesis, we still expected the response pattern to be uniform between classes among the indicator items ( $r_{\text{mean}} = 0.43$ ), despite the extraterrestrial ones.

### Method

#### Participants and Latent Profile Analysis

The sample comprised of the same dataset as in *Study 2* (Swami et al., 2017). We applied the same analysis settings as in *Study 1*. The 15 items of the BCTI questionnaire (e.g., ‘US agencies intentionally created the AIDS epidemic and administered it to Black and gay men in the 1970s.’; see *Appendix*) were rated on a nine-point scale (‘Completely false’ to ‘Completely true’) and served as indicator items for the LPA with eight modeling steps.

### Results

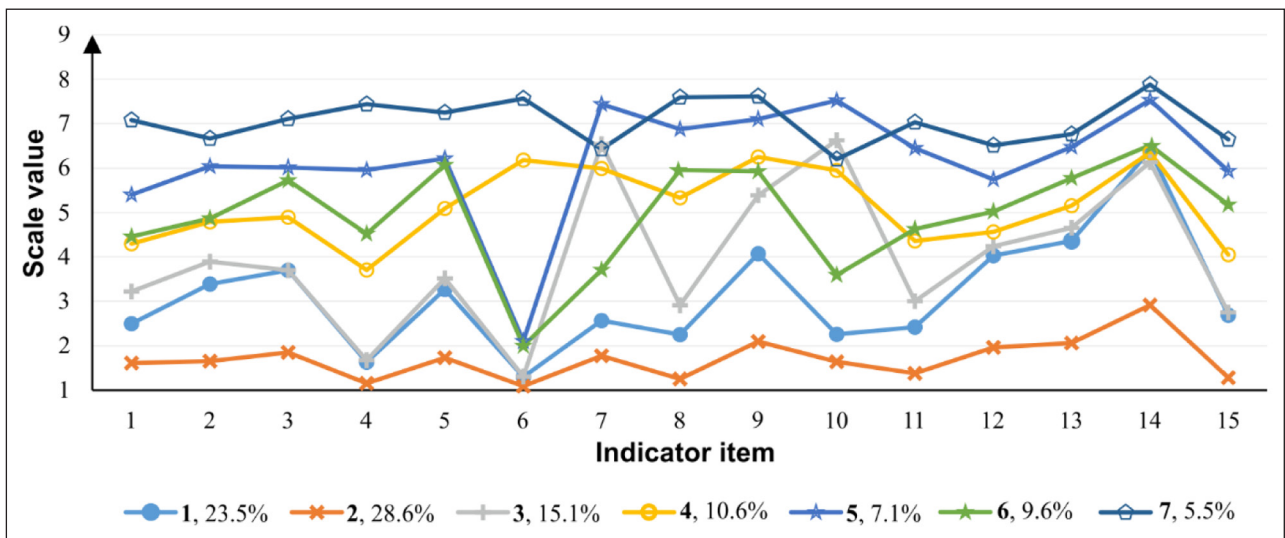
Although a four-class solution seemed feasible, the direct comparison with a seven-class model spoke for the latter (four to seven,  $\text{BF} < 0.01$ ) and the  $p$ -value of the LRT was substantially larger between the seven-class and the eight-class model as well (**Table 3**). The values of Entropy = 0.89 and  $\text{AveP}_{\text{min}} = 0.87$  demonstrated a successful classification of participants into classes in the selected seven-class model.

Most participants were again assigned to classes with consistent response patterns (see **Figure 3**). The classes had significantly different, from class-to-class ascending BCTI mean scores,  $F(6, 796) = 1062.20$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.889$ , with one non-significant post-hoc comparison between classes four and six ( $p = 0.356$ ).

Nevertheless, three classes covering less than  $\frac{1}{3}$  of the sample deviated from this conclusion on the items 6 (moon landing), 7 (alien in area 51), and 10 (recovery of alien craft). Class 6, with medium to high agreements on other items, showed rather low approval ratings on these items, participants of class 5 (with overall high ratings) did not seem to endorse beliefs about a faked moon landing,

**Table 3:** Model fit statistics from Study 3 for latent profile analyses with 1–8 profile solutions.

#	n	LL	BIC	AWE	ICL <sub>BIC</sub>	BF <sub>k, k+1</sub>	LMR-LRT <sub>p-value, k, k-1</sub>	Entropy
1	30	-17083.61	34367.87	34431.50	34367.87	<0.01	–	–
2	46	-15105.95	30519.57	30617.14	30455.00	<0.01	<0.001	0.942
3	62	-14611.48	29637.64	29769.15	29452.38	<0.01	<0.001	0.895
4	78	-14372.49	29266.67	29432.12	29030.68	<0.01	0.015	0.894
5	94	-14160.54	28949.78	29149.16	28737.83	<0.01	<b>0.073</b>	0.918
6	110	-14017.35	28770.42	29003.74	28497.06	<0.01	<b>0.186</b>	0.905
7	126	-13906.25	28655.23	28922.49	28323.97	<0.01	<b>0.139</b>	0.894
8	142	-13815.89	28581.53	28882.72	28250.91	–	<b>0.721</b>	0.901



**Figure 3:** Estimated mean profiles of *Study 3*. The response pattern is overall consistent despite the middle classes on the items covering extraterrestrial topics (6, 7, 10). The response values ranged from 1 to 9.

and participants from class 3, with generally medium approval ratings, appeared to endorse beliefs about alien cover-ups. The agreement on indicator item 14 (suppression of technologies) was generally high for all classes.

**Discussion**

Although the BCTI employs highly diverse specific conspiracy theories, we still observed a rather uniform response pattern. Thus, the relative degree of endorsement was similar among different conspiracy narratives. Importantly, three classes only accounting for a minority of the sample deviated from this pattern on three items. Like *Study 2*, these deviations related to items about extraterrestrial topics and—again—we found a generally high approval among all classes for the item about suppressed information/technologies.

**Study 4**

To bring both aspects of the previous studies about specific and general items together, we applied LPA to a set of conspiracy-related items combining specific theories and more general beliefs. The items were originally developed for another study by Bruder et al. (2013) and yielded medium to high average item intercorrelations

( $r_{\text{mean}} = 0.42$ ). The number of items and the sample size exceed the standards of the previous studies. The aim of the present study is once more to test if the classes mirror a consistent response pattern.

**Method**

**Participants**

We reanalyzed the dataset collected and published by Bruder et al. (2013). The German subsample ( $N = 6240$ ; 1832 females, 4120 males, 288 diverse/no info;  $M_{\text{age}} = 28.90$ ,  $SD_{\text{age}} = 11.36$ ) was recruited online using solicitation mails and the dissemination of the URL on television. The datasets of 5760 participants formed the final basis for LPA after exclusions due to completeness check of data.

**Latent Profile Analysis**

The indicator set for LPA consisted of 38 items (see *Appendix*) ranging from general (e.g., ‘Underground movements threaten the stability of our society.’) to specific topics (e.g., ‘The death of Princess Diana was not an accident, but an assassination.’). Participants rated the probability that the given item is true on an 11-point scale (0% to 100%). The eight modeling steps followed the same settings as noted in *Study 1*.

**Results**

In accordance with the likelihood ratio test, we chose the six-profile solution since the other non-significant comparison suggested a single-profile model that does not represent an informative alternative (see **Table 4**). The model successfully classified participants into classes (Entropy = 0.92, AveP<sub>min</sub> = 0.90).

The analysis yielded a largely uniform response pattern (see **Figure 4**). The mean scores differed significantly between classes,  $F(5, 5754) = 13428.39, p < 0.001, \eta_p^2 = 0.921$ , with significant differences of all post-hoc test. The relative order of classes on almost all items mirrors the class order on the total mean of all items. The profiles 3 and 4 represent an exception: They have highly similar responses in the relative middle segment, but differ substantially from each other on items 5, 16, and 36 dealing with extraterrestrial topics (standardized mean differences for item 5:  $d = 1.45$ , item 16:  $d = 2.13$ , item 36:  $d = 2.15$ ). The items covering the topics about suppression of information (3, 14) were among the items with the highest ratings. Additionally, the profile pattern of classes was highly uniform when summarizing the data by calculating means per class after categorizing the items on seven dimensions (see <https://osf.io/grz6k/>).

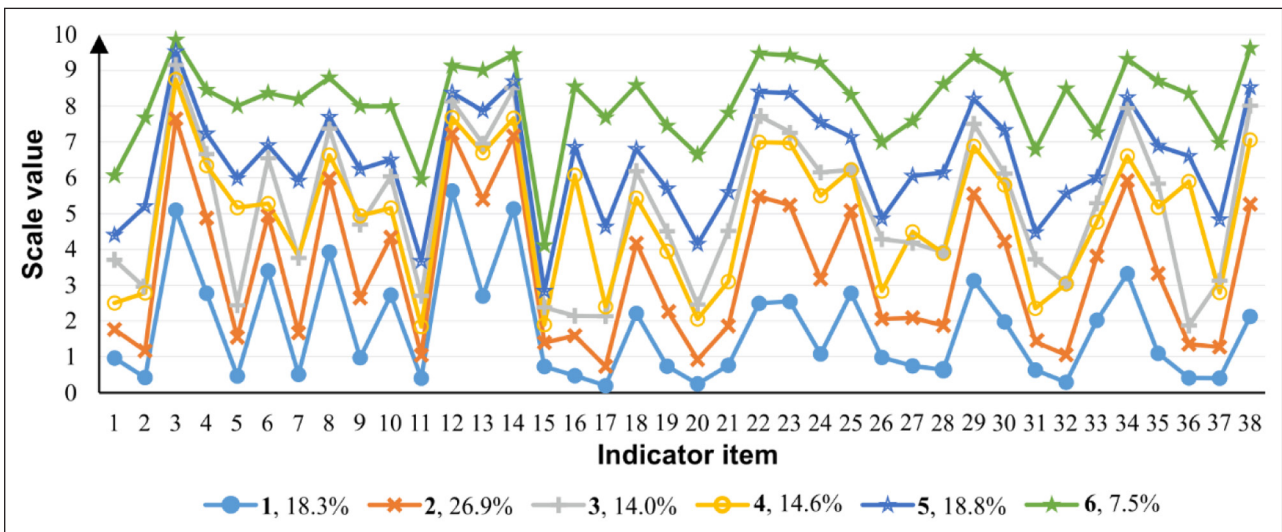
**Discussion**

The LPA applied to many general and specific indicator items in a very large dataset replicated the findings of the previous studies. Across a large and diverse set of statements, the response pattern was uniform across profiles, which is well compatible with the assumption of a general mindset. Again, extraterrestrial topics yielded a differentiation of responses among classes in the middle response approval segment. Items about suppression of (non-extraterrestrial) information were among the indicators with the highest approval ratings for all classes.

Furthermore, **Figure 4** demonstrates among many indicators that the consistency assumption can only be interpreted *relatively* to other classes. The *absolute* item agreement without considering the interclass differences in profiles is much more differentiated. In other words, different conspiracy beliefs have different psychometric difficulty. Thus, agreement on any randomly chosen item is uninformative without information on its relative standing compared to other respondents. High overall agreement with hand-picked conspiracy beliefs may thus lead to faulty conclusion about the prevalence of conspiracy mindsets (Sutton & Douglas, 2020a). Participants of the different classes did not seem to (dis)agree to all narratives

**Table 4:** Model fit statistics from Study 4 for latent profile analyses with 1–8 profile solutions.

#	n	LL	BIC	AWE	ICL <sub>BIC</sub>	BF <sub>k, k+1</sub>	LMR-LRT <sub>p-value, k, k-1</sub>	Entropy
1	76	-310558.26	621774.59	621916.11	621774.59	<0.01	–	–
2	115	-272411.30	545818.35	546032.50	545538.87	<0.01	<b>0.333</b>	0.965
3	154	-261311.79	523957.03	524243.80	523311.57	<0.01	<0.001	0.949
4	193	-256111.87	513894.87	514254.27	512968.61	<0.01	<0.001	0.942
5	232	-253819.72	509648.25	510080.27	508257.70	<0.01	<0.001	0.925
6	271	-252400.03	507146.57	507651.21	505515.92	<0.01	0.041	0.921
7	310	-251124.13	504932.46	505509.73	502847.69	<0.01	<b>0.718</b>	0.907
8	349	-250128.15	503278.19	503928.08	501218.04	–	<b>0.184</b>	0.914



**Figure 4:** Estimated mean profiles of *Study 4*. The response pattern is overall consistent despite the middle classes on the items covering extraterrestrial topics (5, 16, 36). The response values ranged from 0 to 10.



in the same way, but were consistent from a relative inter-class perspective, excluding the extraterrestrial items.

So far, all studies had relied on items that tap into diverse conspiracy beliefs differing in specificity and concreteness. In a final study, we aimed at exploring the latent classes for cases in which conspiracy beliefs refer to the same topic, are logically difficult to reconcile, and have different correlates.

### Study 5

During the 2020 coronavirus pandemic, various conspiracy beliefs upsurged on social media but also very real protests across the globe. Some claimed that the virus (SARS-Cov-2) had not evolved via inter-species transmission as officially claimed but had been manufactured in a laboratory for nefarious purposes (*bioweapon belief*). Others, on the contrary, asserted that the virus was either harmless or did not exist at all and was merely a cover-up to mislead the public, e.g., to enforce means of population control (*hoax belief*). Logically, both narratives are unlikely to be true at the same time. Arguably, they also should have different implications, with the former making the virus appear highly threatening and the latter making it seem negligible. In support of such a differentiation, beliefs of the former kind were correlated with self-centered prepping (hoarding goods and self-medication), whereas the latter were associated with reduced hygiene and social distancing (despite a still substantial positive correlation between the two; Imhoff & Lamberty, 2020).

In *Study 5*, we used these data to examine the consistency of the conspiracy mindset in the most critical test. As these concepts are rather specific and point to a current, directly concerning topic, we also aimed at comparing the more generally measured conspiracy mentality means between the resulting classes.

### Method

#### Participants

Data were collected during the start of the pandemic in March 2020 in the US and UK via *Mturk* and *Prolific* for a published study by Imhoff and Lamberty (2020). The final sample size comprised  $N = 806$  participants (386 females, 410 males, 10 diverse/no info;  $M_{age} = 37.87$ ,  $SD_{age} = 12.16$ ). No datasets were excluded. In addition to

the coronavirus-related conspiracy beliefs, these datasets also included a measure of conspiracy mentality (Imhoff & Bruder, 2014).

#### Latent Profile Analysis

Four indicator items served as a basis for LPA (e.g., 'Dark forces want to use the virus to rule the world.'). See *Appendix*) that were completed on a seven-point Likert scale ('Strongly disagree' to 'Strongly agree'). There were two indicators per narrative (hoax vs. bioweapon). We dropped two inversed-coded items of the original dataset because one of them did not actually map well to our understanding the bioweapon narrative because it leaves other possible explanations open ('I think it's nonsense that the virus was created in a laboratory.'). We, therefore, excluded the reverse-coded item of the hoax concept as well for the sake of consistency and balanced representation of both narratives in the LPA. The final items showed high mean intercorrelations,  $r_{mean} = 0.65$ . The LPA-models (one to eight profiles) were estimated with the same settings as described in *Study 1*. In an exploratory fashion, we compared the resulting classes on their general conspiracy mentality.

### Results

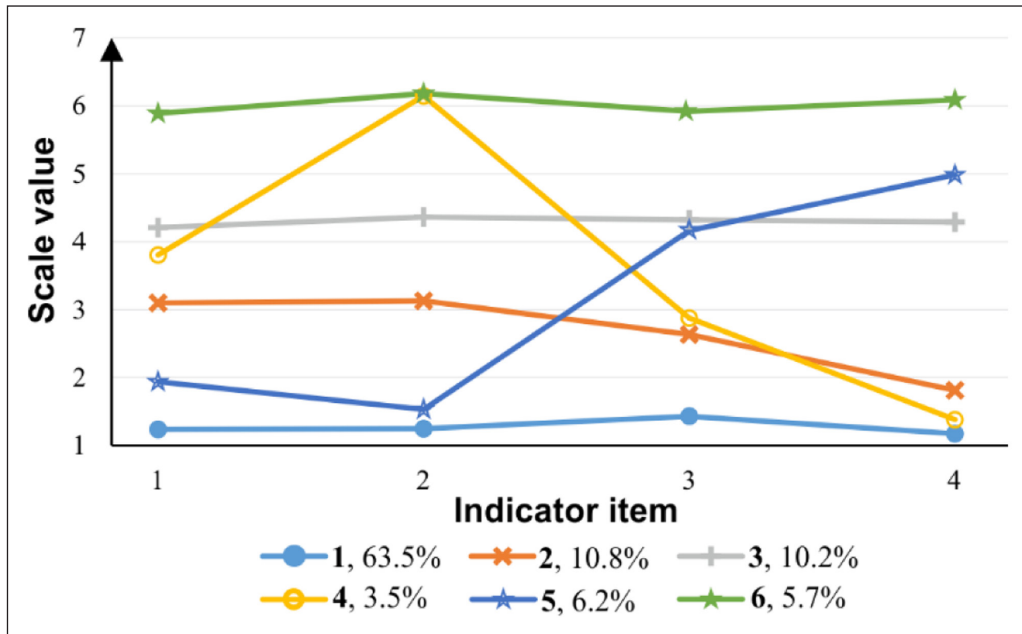
The likelihood ratio test suggests three different solutions (see **Table 5**) and we selected among these the model with the largest number of profiles (six) to cover all relevant response pattern, even in smaller profiles. Participants were accurately assigned to the six classes (Entropy = 0.95,  $AveP_{min} = 0.88$ ).

The profile courses speak mainly in favor of the consistency hypothesis of the conspiracy mindset. Four classes accounting for about 90% of the sample displayed highly consistent responses on the indicators of both narratives (**Figure 5**). There were, however, two comparatively small classes of participants that showed a more noticeably differentiated pattern of endorsing one but refusing the other conspiracy belief. Participants in *hoax*-class 4 showed relatively high ratings on the hoax but rather low ratings on the weapon indicators and vice versa for the *bioweapon*-class 5.

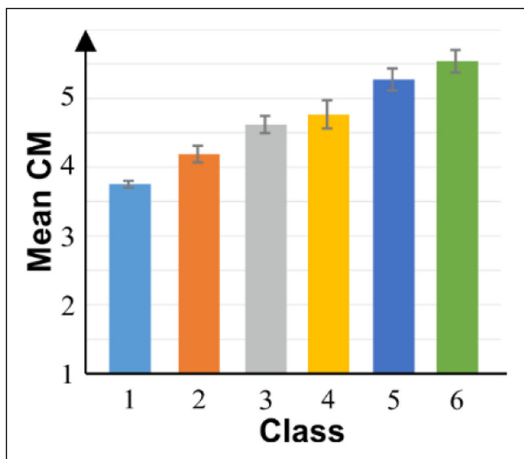
All classes differed significantly on their mean conspiracy mentality scores,  $F(5, 800) = 41.53$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.206$ .

**Table 5:** Model fit statistics from Study 5 for latent profile analyses with 1–8 profile solutions.

#	n	LL	BIC	AWE	ICL <sub>BIC</sub>	BF <sub>k, k+1</sub>	LMR-LRT <sub>p-value, k, k-1</sub>	Entropy
1	8	-6335.54	12724.61	12741.58	12724.61	<0.01	–	–
2	13	-5442.83	10972.65	11000.22	10907.85	<0.01	<0.001	0.942
3	18	-5233.74	10587.94	10626.11	10465.75	<0.01	<b>0.128</b>	0.931
4	23	-5001.03	10155.97	10204.75	10062.12	<0.01	0.004	0.958
5	28	-4896.03	9979.43	10038.81	9878.25	<0.01	<b>0.196</b>	0.961
6	33	-4797.30	9815.43	9885.41	9673.90	<0.01	0.014	0.951
7	38	-4740.66	9735.62	9816.20	9635.24	<0.01	<b>0.158</b>	0.968
8	43	-4690.75	9669.27	9760.45	9501.66	–	<b>0.602</b>	0.95



**Figure 5:** Estimated mean profiles of *Study 5*. The response pattern is overall consistent. Two classes deviated from this pattern and were either endorsing narratives about Covid-19 as a hoax (1 and 2) or as a bioweapon (3 and 4). The response values ranged from 1 to 7.



**Figure 6:** Conspiracy mentality means of all six classes in *Study 5*. The conspiracy mentality means (y-axis) differ systematically between the six classes (x-axis; colors according to *Figure 5*).

In general, higher mean class scores on both COVID-19 conspiracy narratives accompanied higher mean class ratings on the conspiracy mentality scale (see **Figure 6**). There was some exception, though, as the differentiated *bioweapon*-class 5 and *hoax*-class 4 had the second, respectively third-highest rating scores on conspiracy mentality (but they did not differ significantly from their neighboring classes in post-hoc tests, see <https://osf.io/grz6k/>).

**Discussion**

*Study 5* further supported the consistency hypothesis of the conspiracy mindset for most of the participants, even on contradictory conspiracy narratives. The degree of approval for indicators measuring hoax narratives was relatively equal to the agreement to the weapon items

about the COVID-19 pandemic. But two classes that accounted for less than 10% of the sample provided differentiated response pattern by only endorsing hoax or weapon narratives. This demonstrates that, for a small proportion of participants, differentiated beliefs are possible when the narratives at hand are contradictory and that the tendency to endorse conspiracy theories does not necessarily imply to believe *all* of them, even though high intercorrelations might suggest this conclusion at first glance. However, medium to high mean mentality values of a class seemed to be accompanied by the relatively high endorsement of at least one out of two contradictory concepts.

**General Discussion**

Although the existence of a general mindset behind the belief in conspiracy theories is the topic of controversial scientific debates, previous arguments in this debate have referred to variable-centered methods instead of more appropriate person-centered methods. The given five studies applied the person-centered Latent Profile Analysis to a variety of large datasets previously published by other researchers. Results generally strengthen the consistency hypothesis behind the assumption that the tendency to endorse conspiracy theories represents a general mindset. Consistency is manifested in latent classes with consistent relative approval responses over a range of diverse conspiracy-related topics. All five studies confirmed this result, but they revealed important qualifications and differentiations of this assumption as well that were mostly invisible in the variable-centered inter-correlations.

First, the consistent response pattern (such as in the scale used in *Study 1*) was not valid for items dealing with extra-terrestrial cover-up narratives (*Studies 2 to 4*). At least for a

minority of respondents, these items created more differentiated patterns. Specifically, some people seem to endorse such extraterrestrial cover-up beliefs without buying into other conspiracies (lower mindset-scores), whereas other exhibit strong endorsement of more worldly conspiracy beliefs, but less so for alien-related ideas (higher mindset scores). This finding is in accordance with other studies pointing to differences of extraterrestrial narratives compared to other conspiracy theories (Castanho Silva et al., 2017; Nera et al., 2020) and suggests that these narratives may not be a typical part of the conspiracy mindset.

Second, a small proportion of participants endorsed specific theories and deviated from the consistency hypothesis when it comes to contradictory beliefs (*Study 5*). This finding highlights that generalizing from one belief to other contradictory beliefs does account for most, but not all, participants. However, classes with the highest values on the conspiracy mentality scale showed also the strongest endorsements of at least one of these contradicting narratives demonstrating that the general mindset is associated with at least one out of two opposite narratives contradicting the official theory.

Third, the meaning and validity of a consistent mindset needs further clarification. Especially, the results of *Study 4* encourage disentangling the consistency assumption: The mindset reflects the tendency to consider conspiracy narratives as plausible in an overall consistent way, and this tendency must be differentiated from the actual full *belief* in specific theories. The general mindset represents relative, *interindividual* consistent degrees of agreement, but the agreement can sometimes still be rather low in *absolute* terms. If we look at an example from personality psychology, the expression of personality traits can also vary across different situations but can still be interpersonally consistent. We describe the possible characteristics of the mindset that are in accordance with the results of the given studies in the following section.

### **Characteristics of the Conspiracy Mindset**

The studies provide necessary, but not sufficient evidence for the 'existence' of a conspiracy mindset by strengthening its' main prerequisite: the uniformity of response patterns. This is not to be confused with an *essentialistic* (Brick et al., 2021) claim of a true 'existence' of a latent conspiracy mindset. The consistent response pattern observed may be just this: a consistent response pattern. A conspiracy mindset is a parsimonious way to describe this tendency. In psychometric terminology: We make no claim that this mindset is a reflective construct (i.e., the true value of a hidden attribute is reflected in item responses), it may be a formative construct (a variable to describe a pattern of item responses with no surplus meaning; for a discussion of these two, see Edwards & Bagozzi, 2000). Clearly, the mindset is not an explanatory construct (explaining people's tendency to endorse conspiracies with their tendency to endorse beliefs is tautological), but a helpful crutch in systemizing the jungle of different correlates and psychological underpinnings in light of the remarkable consistency in conspiracy related responses.

The general mindset is *continuous* and does not separate dichotomously between acceptance or rejection of beliefs (*Studies 1 to 5*). Dichotomous measurements with explicit choices can lead to different conclusions (Clifford et al., 2019) as they also result in a loss of information in the middle classes ('fence sitters') that are especially important because of their intermediating role between the poles. Critical voices without full beliefs represent an essential part of discussions about conspiracies. Therefore, we prefer the term *endorsement* over the *belief* term concerning the conspiracy mindset. People with higher suspicion towards 'official' narratives often consider the different conspiracy theories as possible and not definite explanations for events (Lukić et al., 2019). Of course, however, they can indeed turn into beliefs in some situations, e.g., when they form a hermeneutically sealed belief system that drives confirmatory information processing with no tolerance for contradictory positions.

Furthermore, the mindset is a *probabilistic* and *relative* psychological construct. Endorsement of conspiracy narratives seems to be consistent in terms of interpersonal comparisons, but can be more differentiated in terms of absolute agreement (*Study 4*). The probabilistic perspective also allows slight differentiations of endorsement concerning some specific narratives (*Study 5*), as it reflects a general tendency (and corresponding thinking style) that can also be partly influenced by personal experiences (Parsons et al., 1999) and (political) ideologies (Miller et al., 2016).

These characteristics imply that defining the conspiracy mindset as a (monological) belief system may be overexaggerating. However, the studies failed to falsify the main assumption of consistency behind the mindset perspective. Political extremes may differ regarding some content specific questions but they still share similar psychological processes (e.g. similar levels of intolerance among Liberals and Conservatives, see Brandt et al., 2014). The mindset construct presumably summarizes a set of multiple underpinnings such as social, epistemic, and existential motivations (Douglas et al., 2017), cognitive mechanisms like analytical thinking (Swami et al., 2014), or demographic factors (Goertzel, 1994). Considering these aspects independently and as single predictors for specific conspiracies would partly challenge the results of the present studies about the consistency of the mindset. However, the interaction of multiple factors remains unclear, and we discuss this and other limitations in the following.

### **Limitations**

The studies have some limitations concerning content and methods. At first, the studies do not offer evidence about the causal structures behind the mindset and possible other third-variable constellations. Does the mindset represent a general predisposition that *pre-activates* processes in terms of higher or lower endorsement and implying a temporal order? Evidence about the causal and temporal relation between the underlying constructs related to conspiracy theories is missing yet.

Methodologically, the appropriateness of the latent profile models depends on the assumption of the existence

of latent classes. The LPA reduces the response pattern of individuals to a few classes and cannot, therefore, represent all individuals perfectly, especially when considering a rather continuous construct. We still think that this method offers more fine-grained and at the same time parsimonious insights than variable-centered methods in this research area.

The resulting fit indices did not always suggest a clear number of classes. Especially, other indices besides the LMR-LRT rarely suggested appropriate superior solutions. It might be argued that the extraction of additional small classes to the presented ones would give a clearer picture. But no indicator suggested a preferable number of classes and extracting further classes would reduce parsimony. We thus settled for the solution that at least one indicator suggested as superior. Importantly, the goal of the present research was not to authoritatively decide on the number of classes, but to test the general pattern of uniform vs. differentiated responses. Extracting different number of classes in robustness analyses did not yield different interpretations.

Another limitation is that the samples in the given studies were not population-representative. Thus, one should refrain from generalizing from these presented class-proportions to the public. Nevertheless, they might still provide a rough estimate of the distributions and offer the possibility to derive useful implications.

#### **Implications and Future Research**

The results have important implications for politics, society, and researchers. It has become increasingly clear that (online) misinformation, often paired with conspiracy narratives, has become a public problem almost across the globe. Many governmental and non-governmental agents have thus risen to the challenge of combating the 'infodemic'. Our studies suggest that groups of respondents differ in their susceptibility to conspiracy theories in a generalizable way from naïve to highly susceptible, which might explain difficulties in discussions between groups with varying degrees of the conspiracy mindset. Especially, groups in the middle could act as societal adhesives between the more extreme poles and hardened fronts. The knowledge about this general mindset might help to target the respective groups adequately. While we observed rather huge differences on many items between the classes, most of them agreed on higher approval ratings for items dealing with the suppression of important information.

The results also suggested that classes with higher conspiracy mindsets were relatively small in our samples. Additionally, the endorsement does not necessarily imply full beliefs in different conspiracies. It is important to consider for polling services that psychometric difficulty also contributes, besides the mindset, to the ratings on conspiracy items highlighting the importance of relative interpretations. We, therefore, want to point out that the topic should not be overexaggerated (Sutton & Douglas, 2020a) and that the study series is not supposed to contribute to a stigmatization (Lantian et al., 2018) that may result from building classes of high conspiracy mindsets.

Methodologically, we demonstrated that generic scales can be useful instruments to measure the general mindset (*Studies 1 to 3*) as they produced results comparable to those of more specific conspiracy theories (although the extraterrestrial items seem to deviate partly from the general mindset structure). The studies also revealed that even high intercorrelations of items sometimes miss specific response patterns within a sample and more fine-grained analyses, such as LPA, can offer additional information on a person-centered level. The LPA might also be a useful method when selecting items in scale development processes.

Future research could examine the causal relations among the associated constructs. To this end, researchers should make more frequent use of longitudinal data on conspiracy theories to help unravel the causal structures. Furthermore, the current state of research requires further investigations on the cognitive processes behind the mindset and the implementation of more experimental methods.

#### **Conclusion**

Our studies provided valuable insights into the general mindset behind the endorsement of conspiracy theories by applying a fine-grained analysis method (LPA). The interpretation of results suggests a unifying approach between the assumptions of a general belief system and more differentiated views. The assumption of a consistent mindset finds data-driven support but also revealed few restrictions that require a more differentiated perspective. The conspiracy mindset represents a relative and continuous construct acknowledging not to put people generally into a drawer.

#### **Additional Files**

The additional files for this article can be found as follows:

- **Supplementary file 1: Appendix.** Item wordings of all five studies. DOI: <https://doi.org/10.5334/irsp.590.s1>
- Data and additional analyses can be obtained from an open access archive (<https://osf.io/grz6k/>).

#### **Competing Interests**

The authors have no competing interests to declare.

#### **Author Contributions**

Both authors conceptualized the research question; the first author ran the analyses and drafted a first manuscript, which was then commented on by the second author.

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