

## **Title and title page**

**(Working)Title:**

**Dynamics of Opposition – How Fear and Sorrow moderate Reactance Arousal during the COVID-19 Pandemic**

## **Study description**

Based on a previous study (Hajek & Häfner, in press) in which we investigated the dynamics of compliance with and political mobilization against the measures to contain the Coronavirus, we are now seeking for additional data in order to test our model. Specifically, we unexpectedly found that specific fear lowers reactance arousal whereas anxiety and dissonance amplify it. In a theoretical model we suggested that there is a channelling process between reactance arousal and the selected coping strategy steering the behavioural outcome towards compliance or resistance. The present data analysis is seeking to further test this model.

### **Research Questions:**

Is there a resilient pattern that concrete fear diminishes reactance arousal and unspecific sorrow amplifies it? And on a process level: Do sorrow and fear mediate the effect from reactance on compliance?

In this project, we want to test our previous findings and translate them into a mediation model using the rich dataset of the Germany COVID-19 Snapshot MONitoring (COSMO).

### **We want to test the following Hypothesis':**

(H1): State Reactance correlates positively with sorrow.

(H1.1.): Different perspective on sorrow differ in strength

(H1.2): The more concrete a sorrow is, the correlation with reactance arousal.

(H2): State Reactance correlates negatively with feelings of fear.

(H2.1.): Concrete fear (being part of a risk group, previous or current contact with active COVID-19 Cases) has an especially strong influence.

Mediation analysis:

(H3): State Reactance correlates negatively with compliance towards the measures to contain the coronavirus.

(H3.1): This relationship is strengthened if it is mediated by sorrow.

(H3.2): This relationship is weakened if it is mediated by fear.

(H3.3): The belief in conspiracy theories moderates the relationship between sorrow and taken measures.

(H3.4): The perception of being part of a risk group moderates the relationship between state reactance arousal and fear.

(H3.5): Personal experiences with COVID-19 moderate the relationship between state reactance arousal and fear.

## **Introduction**

During the Coronavirus Pandemic, extensive, mostly legal, restrictions limited personal and public life. According to the Theory of Psychological Reactance (J. W. Brehm, 1966), these interventions on personal freedom should lead to resistance against the limitations and a devaluation of the decisionmaker in charge. Surprisingly, especially at the beginning of the pandemic, there was compliance instead. Even as the situation developed, coping strategies

mostly affirmed the limitation of freedom among the majority of the German public. How can these dynamics be explained? What causes the individual decision to affirm or refuse measures taken?

In a study we conducted May 4th to May 17th, 2020 (N = 766), we revealed dynamics of compliance with and political mobilization against the measures to contain the Coronavirus in 2020 using reactance theory. We could show that specific fear lowers reactance arousal whereas anxiety and dissonance amplify it. In a theoretical model we suggested that there is a channelling process between reactance arousal and the selected coping strategy steering the behavioural outcome towards compliance or resistance.

Now we want to know:

Is there a resilient pattern that concrete fear diminishes reactance arousal and unspecific sorrow amplifies it? And as an effect: Do sorrow and fear mediate the effect from reactance on compliance?

### **Problem**

Understanding the dynamics catalysing or buffering reactance arousal is a new perspective to understanding compliance within a global health crisis. As an effect, it helps deducing approaches to steering reactance arousal and adjusting communication strategies. Above and beyond the COVID-19 Pandemic, it expands Brehms (1966; Brehm & Brehm, 1981) primarily understanding of translating reactance arousal into action: We argue, that reactance arousal is primarily negative, yet unspecific and needs to be channelled to turn into a concrete action. As a result, re-establishing the lost freedom by force is only one possible outcome of many caused by the motivational urge behind reactance arousal.

### **Review of relevant scholarship**

According to Reactance Theory, the threat to or loss of personal freedom or control – especially if it is individually important – causes a motivational state that raises the urge to restore or protect that freedom (Miron & Brehm, 2006). Freedom includes emotions, behaviour and social interaction (Wicklund, 1974). Reactance arousal manifests in aggressive intentions for future actions, anger or destructive cognition (Dillard & Shen, 2005). The behavioural outcome to restore freedom is diverse: research observed backlashing behaviour (Mann, 2010), exercising a related conduct (Quick et al., 2015), increasing the liking of the endangered choice (Shen, 2015), denying the existence of the threat (Andreoli et al., 1974) or derogating its source (LaVoie et al., 2017; Song et al., 2018). An important catalyst to reactance is social influence (Raab et al., 2016). Reactance can also arouse (Sittenthaler et al., 2016) and coped with vicariously (Quick & Stephenson, 2007; Schwarz, 1984).

The body of literature shows, that the occurrence of reactance as reaction to the measures to contain the COVID-19 Pandemic is highly probable. A number of studies (mostly preprints) highlight its role in non-compliant behaviour (DeFranza et al., 2020; Díaz & Cova, 2020; Kavvouris et al., 2020; Soveri et al., 2020; Sprengholz et al., 2021; Taylor & Asmundson, 2020; Welter et al., 2021) or changed consumerism (Akhtar et al., 2020; Kirk & Rifkin, 2020; Kokkoris, 2020).

This study focusses on the process of reactance instead of stating its influence. To do so, it builds bridges to Cognitive Appraisal Theories of Emotion (APT), which suggests a bidirectional relationship between cognition and emotion in a scenario, where people individually have to cope with stressful situations (Lazarus, 1991; Moors et al., 2013). Out of the tradition of APT, the Extended Parallel Process Model takes these assumptions into a public health scenario explaining how people react towards an unknown health-related risk

with psychological defence strategies (Jahangiry et al., 2020; So, 2013). It shows that anger, as the core-emotion of reactance arousal, arises, if the threat is concrete, not rated as reasonable or the individual feels like being in control. As a result, people use their resources to overcome the threat actively. Anxiety on the other hand leads to compliance due to uncertainty and a high-risk assessment (Valentino et al., 2011).

The Affective Intelligence Model (AIM) adds the perspective of political psychology to this study. It offers an explanation for how emotions steer trust and information gathering habits in politics. Within this process, anxiety can disrupt usual patterns of behavior leading to risen attention to information and compliance whereas anger depresses them, potentially leading to protest (Cialdini & Goldstein, 2004; Glück, 2018; Huddy et al., 2005).

Based on these findings, we argue, that fear channels the impulse to restate freedom resulting of reactance arousal towards compliance, whereas anger has the opposite effect. In a previous study (Hajek & Häfner, in press), we found evidence, that there is a difference between the effect of concrete fear and diffuse sorrows on reactance arousal. Different than fear, diffuse anxiety appears to catalyse reactance and the urge to restore freedom.

In this study, we want to shed light on these differences of channels of reactance assuming that there are different appraisals of the situation leading to different coping strategies and behavioural outcomes.

### **Hypothesis, aims and objectives**

Based on the theoretical preconceptions and our previous study, we want to research the following hypothesis':

(H1): State Reactance correlates positively with sorrow.

(H1.1.): Different perspectives on sorrow differ in strength

(H1.2): The more concrete a sorrow is, the weaker the correlation with reactance arousal.

(H2): State Reactance correlates negatively with feelings of fear.

(H2.1.): Concrete fear (being part of a risk group, previous or current contact with active COVID-19 Cases) has an especially strong influence.

Moderation analysis:

(H3): State Reactance correlates negatively with compliance towards the measures to contain the coronavirus.

(H3.1): This relationship is strengthened if it is moderated by sorrow.

(H3.2): This relationship is weakened if it is moderated by fear.

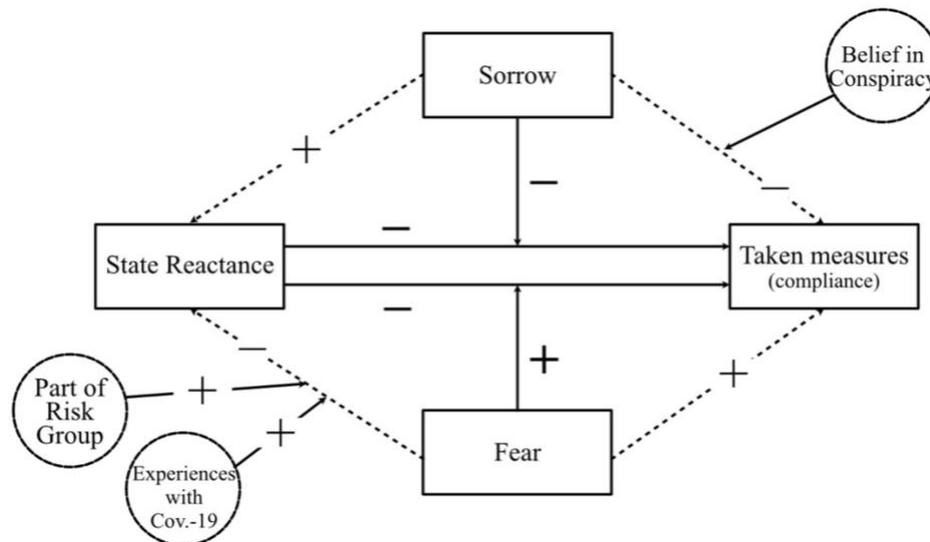
(H3.3): The belief in conspiracy theories moderates the relationship between sorrow and taken measures.

(H3.4): The perception of being part of a risk group moderates the relationship between state reactance arousal and fear.

(H3.5): Personal experiences with COVID-19 moderate the relationship between state reactance arousal and fear.

We assume a variation within the variables over different phases of the pandemic. That is why we tend to analyse data points of four different phases of the pandemic (beginning, midsummer, second lockdown, opening the second lockdown in the end of February.).

The assumed interactions can be found in this figure:



## Materials and Methods

### Sampling Plan / Data collection / Data acquisition

We plan on using the dataset of the Germany COVID-19 Snapshot Monitoring (COSMO). To conduct a reasonable variation within the core-variables, we intend to compare four different waves of COSMO (6th wave: 4/07-08/20, N = 1.024; 17th wave: 7/21-22/20, N = 1.001; 26th wave: 11/10-11/20, N = 1.018; 37th wave: 02/23-24/21, N = 1.012)

Data collection is designed to create a representative sample of German adults regarding age, gender and federal state. The COSMO recruits via the company Respondi which maintains an Online-Panel.

All further information to the sample, data collection and procedure may be found at <https://projekte.uni-erfurt.de/cosmo2020/web/>

### Participant characteristics

Participants reflect the German adult public as described above.

### Variables (manipulated variables; measured variables)

Core variables are Reactance, Fears, Affect, Preparedness - taken measures, Conspiracy Corona (only wave 26), Risk Group Corona / Risk Region, Infection, Probability and Severity, and trust in institutions. to learn something about the nature of sorrow. We will also monitor demographics to be able to describe the sample and potential intercorrelations properly.

An important step before the analysis will be dividing the items to sorrow(s) and fear for the questionnaire queries them together. We will form variables according to theoretical fitting and valid statistical measures (Cronbach's Alpha).

### Analysis Plan

We will conduct analysis guided by the previously formulated hypothesis' as shown in the figure above.

We treat state reactance, fear and sorrow as predictors for taken measures.

You may describe one or more confirmatory analysis in this preregistration. Please remember that all analyses specified below must be reported in the final article, and any additional analyses must be noted as exploratory or hypothesis generating. A confirmatory analysis plan must state up front which variables are predictors (independent) and which are the outcomes (dependent), otherwise it is an exploratory analysis. You are allowed to describe any exploratory work here, but a clear confirmatory analysis is required.

### **Preprocessing**

#### **Data Inclusions/exclusion criteria**

We do not plan to exclude participants.

#### **Transformations**

We will be using four existing data sets. Different items of the groups Affect, Probability and Severity and Fears will form two general items for fear and sorrow as well as factors representing concrete or abstract fear and sorrow of various fields (economic, diffuse, social). The analysis' will be conducted as followed:

### **Tests (Sequential analyses, T-Test, ANOVA, MANOVA, ANCOVA, Pearson correlation, Regression, ...)**

To get different perspectives on sorrow and fear, we initially form new variables out of the items offered by the questionnaire using Cronbach's Alpha.

After a general descriptive overview over all variables, our analysis plan follows our hypothesis':

(H1): State Reactance correlates positively with sorrow.

- Spearman Correlations between State Reactance and sorrow
- Simple linear regression: Sorrow explaining variations in reactance arousal

(H1.1.): Different perspectives on sorrow differ in strength

- Spearman Correlations between State Reactance and different factors of sorrow
- ANOVA: Comparing reactance arousal and different types of sorrow
- Simple linear regressions: Comparing the strength influence of different types of sorrow on reactance arousal

(H2): State Reactance correlates negatively with feelings of fear.

- Spearman Correlations between State Reactance and fear
- Simple linear regression: fear explaining variations in reactance arousal

(H2.1.): Concrete fear (*being part of a risk group, previous or current contact with active COVID-19 Cases*) has an especially strong influence.

- Regression:
  - being part of a risk group → fear (dependent)
  - previous or current contact with active COVID-19 cases → fear (dependent)
  - being part of a risk group & previous or current contact with active COVID-19 cases → fear (dependent)
- Spearman Correlations between State Reactance and
  - being part of a risk group
  - previous or current contact with active COVID-19 Cases

Moderation analysis' (Hayes Process for SPSS)

(H3): State Reactance correlates negatively with compliance towards the measures to contain the coronavirus.

- Spearman correlation
- Simple linear regression with measures to contain the coronavirus as dependent variable

(H3.1): This relationship is strengthened if it is moderated by sorrow.

- Moderation Analysis (Model 1):  
X = state reactance arousal, Y = Measures taken, M = Sorrow

(H3.2): This relationship is weakened if it is moderated by fear.

- Moderation Analysis (Model 1):  
X = state reactance arousal, Y = Measures taken, M = fear

(H3.3): The belief in conspiracy theories moderates the relationship between sorrow and taken measures.

- Moderation Analysis (Model 1):  
X = Sorrow, Y = Measures taken, M = belief in conspiracy theories
- Moderated moderation (Model 3): X = state reactance arousal, Y = Measures taken, M = Sorrow, Z = belief in conspiracy theories

(H3.5): Personal experiences with COVID-19 and the notion of being part of a risk-group moderate the relationship between state reactance arousal and fear.

- Moderation Analysis (Model 1):  
X = Fear, Y = Measures taken, M = Personal experiences with COVID-19
- Moderation Analysis (Model 1):  
X = Fear, Y = Measures taken, M = risk group
- Moderated moderation (Model 3): X = state reactance arousal, Y = Measures taken, M = Sorrow, Z = Personal experiences with COVID-19
- Moderated moderation (Model 3): X = state reactance arousal, Y = Measures taken, M = Sorrow, Z = risk group

For double-check and reflection: additional Spearman-Correlations

- State reactance and the created variables for fear and sorrow
- State reactance and Conspiracy, Risk Group, Infection, Probability and Severity
- Fear and Risk Group, Infection, Probability and Severity, Preparedness - taken measures
- Sorrow and Preparedness - taken measures, Conspiracy Corona, Trust in Institutions, Infection

## References

- Andreoli, V. A., Worchel, S., & Folger, R. (1974). Implied threat to behavioral freedom. *Journal of Personality and Social Psychology*, 30(6), 765–771. <https://doi.org/10.1037/h0037529>
- Brehm, J. W. (1966). *A theory of psychological reactance*. Academic Press.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. Academic Press.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology*, 55(1), 591–621. <https://doi.org/10.1146/annurev.psych.55.090902.142015>
- DeFranza, D., Lindow, M., Harrison, K., Mishra, A., & Mishra, H. (2020). Religion and reactance to COVID-19 mitigation guidelines. *American Psychologist*. <https://doi.org/10.1037/amp0000717>
- Díaz, R., & Cova, F. (2020). *Reactance, morality, and disgust: The relationship between affective dispositions and compliance with official health recommendations during the COVID-19 pandemic*. [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/5zrqx>
- Dillard, J. P., & Shen, L. (2005). On the Nature of Reactance and its Role in Persuasive Health Communication. *Communication Monographs*, 72(2), 144–168. <https://doi.org/10.1080/03637750500111815>
- Glück, A. (2018). Do emotions fit the frame? A critical appraisal of visual framing research approaches. *JOMEC Journal*, 0(12), 101. <https://doi.org/10.18573/jomec.166>
- Huddy, L., Feldman, S., Taber, C., & Lahav, G. (2005). Threat, Anxiety, and Support of Antiterrorism Policies. *American Journal of Political Science*, 49(3), 593–608. <https://doi.org/10.1111/j.1540-5907.2005.00144.x>
- Jahangiry, L., Bakhtari, F., Sohrabi, Z., Reihani, P., Samei, S., Ponnet, K., & Montazeri, A. (2020). Risk perception related to COVID-19 among the Iranian general population: An application of the extended parallel process model. *BMC Public Health*, 20(1), 1571. <https://doi.org/10.1186/s12889-020-09681-7>
- Kavvouris, C., Chrysochou, P., & Thøgersen, J. (2020). “Be Careful What You Say”: The role of psychological reactance on the impact of pro-environmental normative appeals. *Journal of Business Research*, 113, 257–265. <https://doi.org/10.1016/j.jbusres.2019.10.018>
- LaVoie, N. R., Quick, B. L., Riles, J. M., & Lambert, N. J. (2017). Are Graphic Cigarette Warning Labels an Effective Message Strategy? A Test of Psychological Reactance Theory and Source Appraisal. *Communication Research*, 44(3), 416–436. <https://doi.org/10.1177/0093650215609669>
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist*, 46(8), 819–834. <https://doi.org/10.1037/0003-066X.46.8.819>
- Mann, C. B. (2010). Is There Backlash to Social Pressure? A Large-scale Field Experiment on Voter Mobilization. *Political Behavior*, 32(3), 387–407. <https://doi.org/10.1007/s11109-010-9124-y>
- Miron, A. M., & Brehm, J. W. (2006). Reactance Theory—40 Years Later. *Zeitschrift für Sozialpsychologie*, 37(1), 9–18. <https://doi.org/10.1024/0044-3514.37.1.9>
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal Theories of Emotion: State of the Art and Future Development. *Emotion Review*, 5(2), 119–124. <https://doi.org/10.1177/1754073912468165>
- Quick, B. L., Kam, J. A., Morgan, S. E., Montero Liberona, C. A., & Smith, R. A. (2015). Prospect Theory, Discrete Emotions, and Freedom Threats: An Extension of Psychological Reactance Theory: Psychological Reactance. *Journal of Communication*, 65(1), 40–61. <https://doi.org/10.1111/jcom.12134>
- Quick, B. L., & Stephenson, M. T. (2007). The Reactance Restoration Scale (RRS): A Measure of Direct and Indirect Restoration. *Communication Research Reports*, 24(2), 131–138. <https://doi.org/10.1080/08824090701304840>

- Raab, G., Unger, A., & Unger, F. (2016). Die Theorie psychologischer Reaktanz. In G. Raab, A. Unger, & F. Unger, *Marktpsychologie* (4. Auflage, pp. 65–76). Gabler.  
[https://doi.org/10.1007/978-3-8349-6314-7\\_5](https://doi.org/10.1007/978-3-8349-6314-7_5)
- Schwarz, N. (1984). When reactance effects persist despite restoration of freedom: Investigations of time delay and vicarious control. *European Journal of Social Psychology*, *14*(4), 405–419.  
<https://doi.org/10.1002/ejsp.2420140406>
- Shen, L. (2015). Antecedents to Psychological Reactance: The Impact of Threat, Message Frame, and Choice. *Health Communication*, *30*(10), 975–985.  
<https://doi.org/10.1080/10410236.2014.910882>
- Sittenthaler, S., Jonas, E., & Traut-Mattausch, E. (2016). Explaining Self and Vicarious Reactance: A Process Model Approach. *Personality and Social Psychology Bulletin*, *42*(4), 458–470.  
<https://doi.org/10.1177/0146167216634055>
- So, J. (2013). A Further Extension of the Extended Parallel Process Model (E-EPPM): Implications of Cognitive Appraisal Theory of Emotion and Dispositional Coping Style. *Health Communication*, *28*(1), 72–83. <https://doi.org/10.1080/10410236.2012.708633>
- Song, H., McComas, K. A., & Schuler, K. L. (2018). Source Effects on Psychological Reactance to Regulatory Policies: The Role of Trust and Similarity. *Science Communication*, *40*(5), 591–620. <https://doi.org/10.1177/1075547018791293>
- Soveri, A., Karlsson, L. C., Antfolk, J., Lindfelt, M., & Lewandowsky, S. (2020). *Unwillingness to engage in behaviors that protect against COVID-19: Conspiracy, trust, reactance, and endorsement of complementary and alternative medicine* [Preprint]. PsyArXiv.  
<https://doi.org/10.31234/osf.io/mhctf>
- Sprengholz, P., Felgendreff, L., Böhm, R., & Betsch, C. (2021). *Vaccination Policy Reactance: Predictors, Consequences, and Countermeasures* [Preprint]. PsyArXiv.  
<https://doi.org/10.31234/osf.io/98e4t>
- Taylor, S., & Asmundson, G. J. G. (2020). *Negative attitudes about facemasks during the COVID-19 pandemic: The dual importance of perceived ineffectiveness and psychological reactance* [Preprint]. Psychiatry and Clinical Psychology. <https://doi.org/10.1101/2020.11.17.20233585>
- Valentino, N. A., Brader, T., Groenendyk, E. W., Gregorowicz, K., & Hutchings, V. L. (2011). Election Night's Alright for Fighting: The Role of Emotions in Political Participation. *The Journal of Politics*, *73*(1), 156–170. <https://doi.org/10.1017/S0022381610000939>
- Welter, V. D. E., Welter, N. G. E., & Großschedl, J. (2021). Experience and Health-Related Behavior in Times of the Corona Crisis in Germany: An Exploratory Psychological Survey Considering the Identification of Compliance-Enhancing Strategies. *International Journal of Environmental Research and Public Health*, *18*(3), 933. <https://doi.org/10.3390/ijerph18030933>
- Wicklund, R. A. (1974). *Freedom and reactance*. (pp. x, 205). Lawrence Erlbaum.