

**Socio-Economic or Emotional Predictors of Populist Attitudes across Europe**

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**Funding Note**

This research was funded by the H2020 project *Democratic Efficacy and the Varieties of Populism in Europe* (DEMOS) under H2020-EU.3.6.1.1. and H2020-EU.3.6.1.2. (Grant agreement ID: 822590).

**Abstract**

Previous research on predictors of populism has predominantly focused on socio-economic (e.g., education, employment, social status), and socio-cultural factors (e.g., social identity and social status). However, during the last years, the role of negative emotions has become increasingly prominent in the study of populism. We conducted a cross-national survey in 15 European countries (N=8059), measuring emotions towards the government and the elites, perceptions of threats about the future, and socio-economic factors as predictors of populist attitudes (the latter operationalized via three existing scales, anti-elitism, Manichaeic outlook, people-centrism, and a newly developed scale on nativism). We tested the role of emotional factors in a *deductive* research design based on a structural model. Our results show that negative emotions (anger, contempt and anxiety) are better predictors of populist attitudes than mere socio-economic and socio-cultural factors. An *inductive* machine learning algorithm, *Random Forest* (RF), reaffirmed the importance of emotions across our survey dataset.

*Keywords:* anger, anxiety, contempt, emotions, populism, social identity, threat

### **Explaining Populism across Europe**

Populism has been on the rise for some time across Europe (Rooduijn & Akkerman, 2017) and numerous studies in communication research, political science, psychology and sociology have been published on explaining populism, ranging from the political system and opportunity structures (Salmela & von Scheve, 2018), the role of the media (Aalberg & de Vreese, 2016; Krämer, 2014; Schaub & Morisi, 2019; Schulz, Wirth, & Müller, 2018), communication styles (Abadi, 2017; Busby, Gubler, & Hawkins, 2019); de Vreese, Esser, Aalberg, Reinemann, & Stanyer, 2018; Nai, 2018), public health inequality (Lindström, 2020), political participation (Zaslove, Geurkink, Jacobs, & Akkerman, 2020) and individual factors, such as personality characteristics (Bakker, Rooduijn, & Schumacher, 2016), or lower cognitive abilities (Hodson & Busseri, 2012).

There are many debates about the exact conceptualization of populism (see Hameleers, Bos, & de Vreese, 2017; Hameleers, 2018; Schulz et al., 2017; Wirth et al., 2016; Wirz, 2018), yet, there is growing consensus that populism is defined by the opposition between 'the people' and 'the elites' (e.g., Rodrik, 2019). Several scholars have thus pleaded to pay more explicit attention to the role of emotions in explaining support for populist reasoning (e.g., Rhodes-Purdy, Navarre, & Utych, 2020; Salmela & Von Scheve, 2018).

In this research, we examine three types of explanations for citizens' support of populist views (see also Kyle & Gultchin 2018; Oesch, 2008). The first (1) relates to socio-economic factors, implying that economic hardship explains why people embrace populist parties. The second (2) refers to socio-cultural determinants, i.e. the loss of cultural values, or threats to one's social identity, while the third (3) focusses on the role of emotions. These three types of explanations are not mutually exclusive, and perhaps equally important. However, to date these explanations have mostly been examined in independent samples. In

our current study, we examine socio-economic, socio-cultural and emotional factors within the same sample.

### **The Role of Socio-Economic Factors**

The first explanation for the support of populist arguments relates to socio-economic factors. At the individual level this economic hardship would explain the distrust of poor and low-educated people towards the government and the elites (Streeck, 2017). Indeed, previous studies have shown that economic insecurity, based on unemployment, bad employment prospects, or low income, is strongly associated with support for right-wing populist parties (e.g., Lubbers et al., 2002). This can be observed at the individual level, but also at a country level. Increased economic uncertainties, especially for relatively low skilled workers in countries with high inequality between the rich and the poor, would be consistently associated with the growth of a right-wing populist electorate (e.g., Betz, 2018; Jay et al., 2019; Lubbers, Gijsberts, & Scheepers, 2002; Sprong et al., 2019; Swank & Betz, 2003). Interestingly, country-level indicators of unemployment are also important sources for individual perceptions of economic hardship. This points to the importance of *relative deprivation*, namely the subjective assessment that oneself or one's group is worse off compared to other individuals or groups (Burgoon, van Noort, Rooduijn, & Underhill, 2018; Ellemers, 2002; Rooduijn and Burgoon; 2018; Smith & Ortiz, 2002). We expect that populism is stronger in countries with higher inequality where the socio-economic gap between 'the people' and 'the elites' is most visible (see also Franko & Witko, 2017).

### **Social Identity**

The second type of explanation for the support for populism relates to socio-cultural determinants, i.e. the loss of cultural values, or threats to one's identity. According to modern versions of *social identity theory* (Brown, 2000; Hogg, 2001a, 2001b), people derive their mental well-being and self-esteem not only from feeling good about themselves, but also

about the important groups or country they belong to. In times of rapid and recurrent changes, either in one's own life or in society at large, people start feeling threatened because their social identity is also object to change. Questions about who they are, where they come from, what kind of society they live in, all become more prominent in times of unpredictable changes (Abrams & Hogg, 2010; Brown, 2000; Hogg, 2001a; 2001b;), whereas derogating the out-group (*in-group favoritism* versus *out-group derogation*). In other words, the populist characteristic of 'Us' versus 'Them' reasoning (*social categorization*) can thus be seen as an immediate result of the perceived threat to one's social identity.

In sum, perceived threat, especially to one's cultural values, may be considered an important determinant of populism. Feelings of threat should therefore be related with one's social identity, and with the implied identification with one's own country: the stronger one identifies with one's own country, the more likely it is that one feels threatened by new values, belief systems or ideologies.

### **Anxiety, Anger and Contempt**

Various studies have recently explored the role of emotions in the development of populist attitudes, extremism or negative attitudes towards out-groups, for example, by studying emotion-eliciting appeals instead of rational arguments (Wirz et al., 2018) or by showing that emotions not only lead to greater support, but also maintain support for populist parties (e.g., Nguyen, 2019). Emotions can be differentiated on the basis of the appraisals of the situation (positive - negative, self-blame – other-blame, certain – uncertain, in control – not in control, etc.), and on the basis of motivational tendencies, such as the motivation to attack or to withdraw (see Lazarus, 2001; Lerner, Li, Valdesolo, & Kassam, 2015; Hameleers et al., 2017; Scherer, Schorr, & Johnstone, 2001).

Anger seems one of the most prominent emotions in eliciting populist views (e.g., Hameleers et al., 2017; Nguyen, 2019; Rico, Guinjoan, & Anduiza, 2017; 2020). Anger is

elicited when one's goals are frustrated, and a person's behavior or an event is appraised as negative and unfair, while the other party is to blame (rather than oneself). This set of appraisals generally leads to criticism, or (verbal or physical) attack, in order to remove the obstacle to one's goal (e.g., Frijda, 1986; Moors, Ellsworth, Scherer, & Frijda, 2013; Roseman, 1984). We propose that contempt may also play a role in populist attitudes, as a close alternative to anger. Contempt implies the derogation of the other person, appraising the other not only as to blame, but as inferior. These appraisals lead to the tendency to exclude or ignore the person completely, because the target is not even worth attacking (e.g., Fischer & Giner-Sorrolla, 2016). Citizens may feel both anger and contempt in reaction to the actions of the government and the elites, which may fuel populist rhetoric. In fact, anger and contempt may also lead to different types of collective action: anger has been associated with legal protest and normative action, and contempt with illegal and violent actions (Tausch et al., 2011), because the latter emotion implies no commitment with authorities or the government anymore, thereby allowing actions that are destructive.

In addition to anger and contempt, fear or anxiety has also been mentioned as a central emotion in populist reasoning. Indeed, when citizens feel threatened, either because of economic hardships or the loss of their cultural identity, this leads to *out-group derogation*, which is also a key feature of populism (e.g., Nguyen, 2019; Wirz et al., 2018). Thus, different emotions may play a role in the development of populist attitudes.

### **The Current Study**

In the current study, we measured socio-economic, socio-cultural and emotional factors and inspected to what extent they can explain populist attitudes in a large sample of 15 European countries. Whereas there are obviously differences between these countries, in this research we do not focus on cross-national differences, but on the relations between these different types of variables and populist attitudes.

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We examined three clusters of factors in relation to *Populist Attitudes*. Socio-economic factors were included at the individual-level (participants' *Education* and *Employment*), as well as the country-level (*Inequality Index*), in order to tap relative economic deprivation.). Socio-cultural factors were measured by a scale of relative social deprivation: *Subjective Social Status* and *Social Identity* (operationalized as the identification with one's current country). Emotional factors included measures of *Anxiety* (operationalized by realistic and symbolic threat), *Anger* and *Contempt* (operationalized as shared appraisals).

We will analyze this step by step, by subsequently answering the following research questions (RQs):

RQ1. What is the relationship between socio-economic factors (*Inequality Index*, *Education and Employment*), socio-cultural factors (*Subjective Social Status*, *Social Identity*), emotional factors (*Anxiety*, *Anger*, *Contempt*) and *Populist Attitudes*?

RQ2. How do the interactions between socio-economic factors and socio-cultural factors affect *Populist Attitudes*?

RQ3. Do socio-cultural factors individual-level socio-economic factors and emotional factors mediate the effects of country-level socio-economic factors towards *Populist Attitudes*?

### Methods and Design

After reporting the means, standard deviations and correlations of all included variables, we conducted a *Path Analysis*, which is a special case of *Structural Equation Modeling* (SEM). In a basic SEM model, we tested the hypothesis whether emotional factors (*Anxiety*, *Contempt* and *Anger*) mediate the effect of *Inequality Index* on *Populist Attitudes*. In an advanced SEM model, we tested the additional effects of participants' socio-economic factors (*Education* and *Employment*) and socio-cultural factors (*Subjective Social Status*, *Social Identity*) on *Populist Attitudes*.

### Sampling Procedure and Data Collection

We examined our research questions in a large-scale cross-national study across 15 European countries.<sup>1</sup> The variety of European countries of different socio-economic structures and political cultures allowed us to include differences in inequality within a country, in addition to individual level variables. Our desired representative sample size amounted to approximately 500 respondents per country, while quotas based on current UN-census data (*UNdata*) were set up for age, gender and geographical region. The key *eligibility criterion* for respondents was having lived in their current country of residence for at least 10 years, which we consider as a sufficient time frame to feel at home in the country of residence. In the *Informed Consent* respondents were instructed about the purpose of our study, their voluntary participation and guaranteed privacy based on GDPR regulations. We obtained ethical approval from the Faculty Ethics Review Board of the University of Amsterdam (Number 2019-SP-10754).

### Survey

The survey started with information about the study and the request for informed consent (see Supplemental Material). All respondents were required to give informed consent before they could proceed to the actual questions. Unless specified otherwise and except for demographics and media usage behavior, respondents were requested to indicate their agreement with a statement on a 7-point Likert-scale, ranging from *strongly agree* to *strongly disagree*. Our survey mainly included existing scales<sup>2</sup>. Cronbach's Alpha ( $\alpha$ ) is the most

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<sup>1</sup> Our sampled 15 countries include Bosnia-Herzegovina, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Lithuania, the Netherlands, Poland, Slovakia, Spain, Turkey and the United Kingdom.

<sup>2</sup> In some cases, we used shortened versions of the original scale, in order to prevent the questionnaire from becoming too long. Further scales included in our survey were: *Conspiracy Mentality Questionnaire* (CMQ; Bruder, Haffke, Neave, Nouripanah & Imhoff, 2013), *Need for Closure* (Roets & Van Hiel, 2011), *Emotional Partisan Attachment* (Bankert, Huddy & Rosema, 2017) and *Political Efficacy* (European Social Survey ESS, International Social Survey Programme, Eurobarometer).

common measure of internal consistency ("reliability") of survey items and it is used here to determine how reliable our multiple Likert-scale questions are.<sup>3</sup>

### *Populist Attitudes*

This scale was based on existing items by Castanho Silva, Jungkunz, Helbling and Littvay (2019), consisting of *People-Centrism* (e.g., "Politicians should always listen closely to the problems of the people"), *Anti-Elitism* (e.g., "The government is pretty much run by a few big interests looking out for themselves"), and *Manichaeian Outlook* (e.g., "You can tell if a person is good or bad if you know their political views"). We also added three items to measure *Nativism*, such as "The political elites have failed to protect our cultural identity". Nativism focuses on the idea that people being native to a country believe to have more rights to be treated fairly, and to receive priority treatments when living in the country of birth (Betz, 2017; Hochschild, 2018; Heiss & Matthes, 2019; Mudde, 2012), while 'foreigners' and elites behaving 'foreign' are considered a threat to the native nation (Kešić & Duyvendak 2019). The ten items formed a reliable scale (Cronbach's  $\alpha = .66$ ). While this value is not high, it lies in the commonly referred as "acceptable" range for Cronbach's Alpha ( $\alpha$ ). Further, the scale is based on and supported by previous research (see Castanho Silva et al., 2018, p. 158), in which items were chosen based on scalar invariance, average loadings, and distributional characteristics, including at least one negative-worded item in each subscale. Based on an initial CFA assessment, only the original formulation of three scales were recommended, such as Akkerman, Mudde, and Zaslove (2014); Castanho Silva et al. (2018), and Schulz et al. (2018). Originally, this had resulted in at least four items per sub-scale with invariant factor loadings across all eight samples for each construct plus few invariant intercepts across all countries, thus making them suitable for cross-national comparisons. The addition of three *Nativism* items did not affect the reliability score negatively, further

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<sup>3</sup> Further variables were measured but are not be reported in the present study.

supporting the sufficient reliability of this scale.

### ***Socio-Economic Factors***

**Inequality Index.** We included the *Inequality Index* per country, which is based on the latest *Inequality of Income Distribution*<sup>4</sup> (INDIC-IL) data as provided by *Eurostat*.

INDIC-IL describes the S80/S20 income quintile share ratio by sex and selected age group based on latest EU-SILC and ECHP surveys (Table 1). Higher scores indicate higher inequality in each country.

Table 1

*Inequality Index per Country based on latest Inequality of Income Distribution (INDIC-IL)*

Country	Inequality Index
Czech Republic	3.4
Slovakia	3.5
Netherlands	4
Denmark	4.1
Hungary	4.3
France	4.4
Germany	4.5
Poland	4.6
United Kingdom	5.4
Bosnia-Herzegovina	5.7
Italy	5.9
Greece	6.1
Spain	6.6
Lithuania	7.3
Turkey	8.7

**Education and Employment.** *Education* level was dimensioned across low (up to high school degree), middle (technical/vocational degree) and high levels (university degree). For *Employment* status, participants could check the following categories: unemployed, retired, student and (self)employed.

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<sup>4</sup> For *Inequality of Income Distribution* INDIC-IL (last update 15.10.2020) see also: [https://ec.europa.eu/eurostat/web/products-datasets/-/ilc\\_pns4](https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_pns4)

**Subjective Social Status.** We used the *MacArthur Scale of Subjective Social Status* (Adler, Epel, Castellazzo, & Ickovics, 2000), which depicts an ascending ladder between zero and ten, measuring the perceived socio-economic status of respondents.

**Social Identity.** This scale was based on Ellemers, Spears and Doosje (2002), *Self and Social Identity* and used three items: "Do you feel [British]?", "Being [British] is an important part of who I am", and "Do you feel at home in [the UK]?". The three items formed a reliable scale (Cronbach's  $\alpha = .82$ ); higher scores reflect more identification with the country in question.

**Anxiety.** This scale was based on 8 existing items, measuring *realistic and symbolic threats* (Stephan, Ybarra, & Morrison, 2009). However, Cronbach's Alphas ( $\alpha$ ) for both realistic and symbolic threats were unsatisfactory, and we therefore decided to collapse 6 items into one scale, which reflect participants' anxiety about their own well-being, both in terms of economic conditions, as well as their cultural identity (e.g., "I am anxious about what the future will bring" and "The immigration of people from many other countries is a threat to my values"). The six items formed a reliable scale (Cronbach's  $\alpha = .65$ ).

**Anger.** We developed a scale based on previous appraisal items measuring anger (Fischer & Roseman, 2007) and applying them to appraisals related to the government, the elites and the people. We decided not to ask participants directly about their anger at the government, because of their potential fear for retaliation, but instead to point out how people around them thought about a statement, e.g., "Many people around me think that the government has betrayed us". Although this phrasing is not similar to asking people how they feel themselves, we assumed that their friends' and intimates' feelings about a topic can be generally viewed as a proxy for their own feelings. The five items formed a reliable scale (Cronbach's  $\alpha = .84$ ).

**Contempt.** Similar to *Anger*, this variable was measured by tapping into appraisals of

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how people around them think. We used three items that have shown to best describe *Contempt*, namely derogation and exclusion: "Many people around me would like to get rid of politicians". The three items formed a reliable scale (Cronbach's  $\alpha = .73$ ).

**Demographics.** Our survey also included background questions regarding gender, age, religion, ethnicity and marital status, which will not be reported in the current manuscript (see Supplemental Material).

### **Procedure**

The survey was first developed in English and then translated into 14 other languages by native speakers of our consortium partners, before being back-translated to English. In addition, each survey version was individualized based on country specifications, such as country name and language terms. All translated surveys were uploaded on *Qualtrics* online survey platform (Version: July 2019) and the survey data were collected after being synchronized with a global research platform (*Cint*), which provided us a heterogeneous pool of survey respondents across the 15 European countries involved in our project.

A *pre-test* with 50 respondents per country was run to evaluate the survey time taken (on average between 11 and 15 min). It also aimed to assess the clarity of survey items and its suitability to respondents across various countries. Our pre-test results were satisfactory and no further survey revisions were required. In total, our survey resulted in 9995 respondents, while 1936 respondents with missing values were excluded, resulting in 8059 complete respondents.

## **Results**

### **Descriptive Statistics**

#### ***Respondents***

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Our survey sample included quotas based on current UN-census data set up for age, gender and geographical region (See Supplemental Material).<sup>5</sup>

**Relations between Variables (RQ1).** Table 2 presents the means, standard deviations, and inter-correlations of the variables in this study (see also Figure 1).

Table 2

*Means, Standard Deviations, and Inter-Correlations of Variables (\*p < .05, \*\*p < .01, \*\*\*p < .001)*

	Mean	SD	Inequality Index	Education	Employment	Subjective Social Status	Social Identity	Anger	Anxiety	Contempt	Populist Attitudes
Inequality Index	5.22	1.39	-								
Education	3.80	1.67	0.167***	-							
Employment	3.80	1.46	0.028*	0.19***	-						
Subjective Social Status	5.52	1.88	0.014	-0.061***	-0.085***	-					
Social Identity	6.16	1.10	-0.022*	-0.031**	0.005	-0.06***	-				
Anger	5.31	1.15	0.054***	-0.012	0.039***	0.042***	-0.032**	-			
Anxiety	4.04	1.09	0.127***	-0.068***	0.044***	0.042***	-0.083***	0.289***	-		
Contempt	5.19	1.21	0.048***	-0.035**	0.057***	0.014	-0.056***	0.726***	0.318***	-	
Populist Attitudes	4.94	0.77	0.018	-0.084***	0.017	0.021	0.068***	0.562***	0.437***	0.551***	-

Overall, there is no significant correlation between socio-economic factors (*Inequality Index, Employment and Education*) and *Populist Attitudes*, except for a very small, i.e. meaningless, negative correlation with *Education*. Moreover, there is no correlation between socio-cultural factors (*Subjective Social Status*) and *Populist Attitudes*, although there is a very small correlation between *Social Identity* and *Populist Attitudes*. And, there is only a very small correlation between socio-economic and emotional factors. On the other hand, the correlations between, *Anger, Contempt and Anxiety* with *Populist Attitudes* are relatively

<sup>5</sup> A Multivariate Analysis of Variance (MANOVA) showed no significant differences in these key variables across 15 European countries.

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strong (between .40 and .56). *Anger* and *Contempt* are also highly correlated with each other, however less with *Anxiety*.

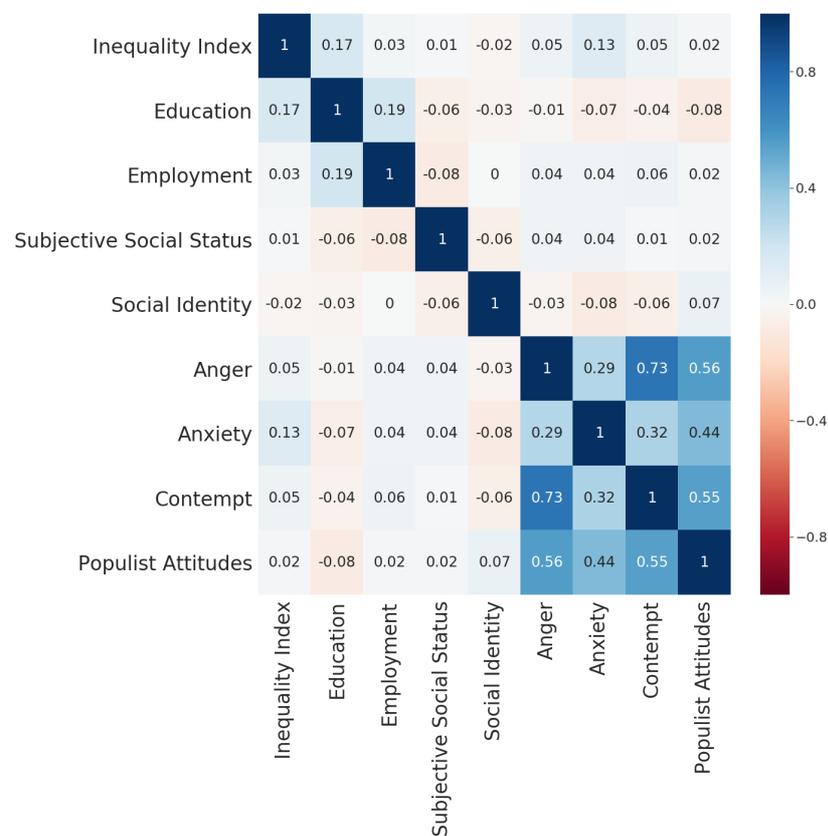


Figure 1. Correlation Matrix between Variables (scale between -0.8 and 0.8).

In sum, our correlations show that the relationship between emotional factors (*Anxiety*, *Anger*, *Contempt*) and *Populist Attitudes* is much stronger than between socio-economic (*Inequality Index*, *Education*, *Employment*) as well as socio-cultural factors (*Perceived Social Status*, *Social Identity*) and *Populist Attitudes*.

### Path Analysis (PA)

Next, we investigated how the interactions between socio-economic factors (*Inequality Index*, *Education* and *Employment*) and socio-cultural factors (*Subjective Social Status*, *Social Identity*) affect *Populist Attitudes* (RQ2). We included an objective country-level socio-economic factor (*Inequality Index*) as an exogenous variable (not caused), which

would consider country differences, and in order to explore its relationship with further factors and *Populist Attitudes*.

First, we examined whether emotional factors (*Anxiety*, *Anger* and *Contempt*) mediate the relation between our country-level variable *Inequality Index* and *Populist Attitudes*. This hypothesis was tested with a *Path Analysis (PA)*, which is a type of multiple regression (a) to estimate the parameters of a structural model and (b) to assess various mediation effects (Gunzler, Chen, Wu, & Zhang, 2013). Moreover, it is the application of *Structural Equation Modeling (SEM)* by using *observed* variables only, devoid of any *latent* variables. For SEM, which is a deductive research design, we used the *lavaan-package* in *R* (Rosseel, 2012). The model fit of a SEM model is assessed using the chi-square test, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). According to Hu and Bentler (1999) and Kline (2015), a reasonable fit is indicated by a non-significant chi-square (divided by the degrees of freedom in case of large sample sizes), a CFI value  $>.95$ , an RMSEA smaller than  $.06$ , and an SRMR smaller than  $.08$ .

Our basic SEM model (Figure 2) shows a significantly strong prediction effect (standardized) of *Anger* ( $\beta = .29$ ) and *Contempt* ( $\beta = .32$ ) on *Populist Attitudes* ( $\beta = .28$ ) mediated by *Anxiety*, resulting in the following fit indices: chi-square (2) = 2.96,  $p = .227$ , chi-square/degrees of freedom = 1.48, CFI = 1.0, RMSEA =  $.008$  with the 90% confidence interval  $[.000-.025]$ , and SRMR =  $.004$ .

We conducted a *Wald Test* (equivalent to a *Z-test*), which tests the relationship between independent variables (predictors) and the dependent variable and the effect of dropping parameters (i.e., regression paths) by comparing nested models. Our *Wald-Test* did not suggest any regressions paths to be removed, because the p-values given for the Z-statistic  $P(>|z|)$  were all lower than the conventional threshold of  $.05$  and hence significant.

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The covariance path between *Anger* and *Contempt* was added due to the high correlation of the observed factors, and despite not shown explicitly in Figure 2, the double arrow shows the residual covariance, since *Anger* and *Contempt* are *endogenous* variables.

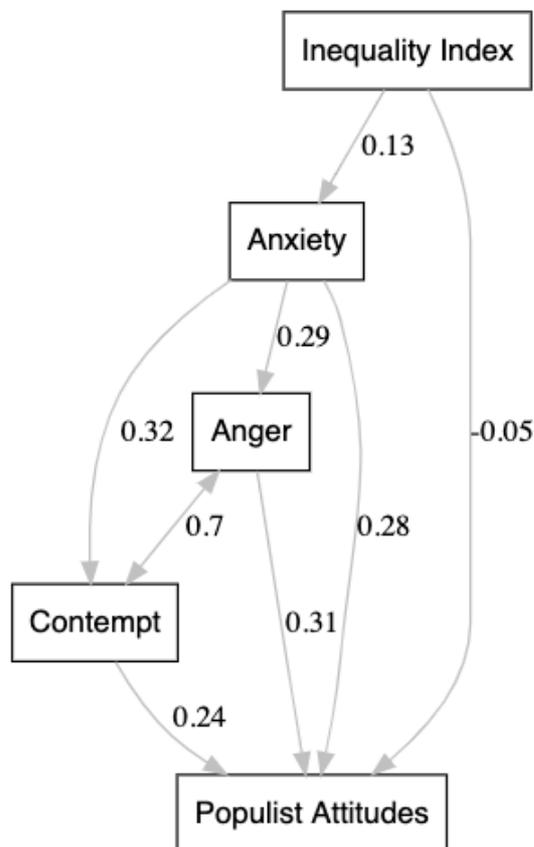


Figure 2. Basic Structural Equation Model (standardized; N=8059). Only significant paths with a standard estimate larger than 0.05 are depicted (double-headed arrows = residual covariance paths; single-headed arrows = regressions paths).

Several mediation effects are found in our basic SEM model. While there is a direct path from *Inequality Index* towards *Populist Attitudes*, we explore the mediation in this relationship through emotional factors. At the same time, *Anger* and *Contempt* mediate the effect of *Anxiety* towards *Populist Attitudes*. All these effects were tested for significance using *bootstrap based p-values*. The total effect from the *Inequality Index* to *Populist Attitudes* is the only non-significant effect. On the one hand, this may seem contradictory, but

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it stems from the fact that the direct path is negative, while all other mediating paths are positive, therefore canceling each other out and rendering the total combined effect of direct and indirect effects from *Inequality Index* to *Populist Attitudes* non-significant and negligible. This phenomenon is called *inconsistent mediation* (MacKinnon, Fairchild, & Fritz, 2007). All other effects are significant - the explained variance ( $R^2$ ) of *Populist Attitudes* for this SEM model is 0.427, which is moderately high, a more than satisfactory result in this context. In addition, although *Anxiety* has a large direct effect on *Populist Attitudes* ( $\beta = .28$  standardized), the indirect effects through *Anger* and *Contempt* are also considerable ( $\beta = .17$  standardized). Although the direct effect of *Anxiety* on *Populist Attitudes*, when tested without mediators, was of the same magnitude ( $\beta = .44$  standardized), the overall explained variance ( $R^2$ ) for *Populist Attitudes* (as a dependent variable) became 0.192, much smaller than before. These different mediation paths in the SEM model show the importance of emotional factors in mediating the country level effect of *Inequality Index*.

Next, we examined how socio-economic (*Education* and *Employment*) and socio-cultural factors (*Subjective Social Status* and *Social Identity*) as well as emotional factors (*Anxiety*, *Anger* and *Contempt*) mediate the effects of the country-level socio-economic factors (*Inequality Index*) towards *Populist Attitudes* (RQ3). In an advanced SEM model (Figure 3), we tested the indirect (mediation) effects of socio-cultural factors (*Social Identity*, *Subjective Social Status*) as well as socio-economic factors (*Employment*, *Education*), in order to compare their influence with the emotional factors. In this case, we removed the regression path from the *Inequality Index* towards *Anxiety*, making the latter an *exogenous* variable due to the results observed in our basic SEM model, while adding a covariance path between both, which is a common rule with *exogenous* variables (see Kline, 2015). This advanced SEM model had the following fit indices: chi-square (20) = 625.675,  $p < .001$ , chi-square/degrees of freedom = 31.28, CFI = .952, RMSEA = .061 with the 90% confidence

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interval [.057–.065], and SRMR = .040. Despite the chi-square being significant, the rest of the fit indices indicate a rather good fit, especially considering the large sample size (8059).

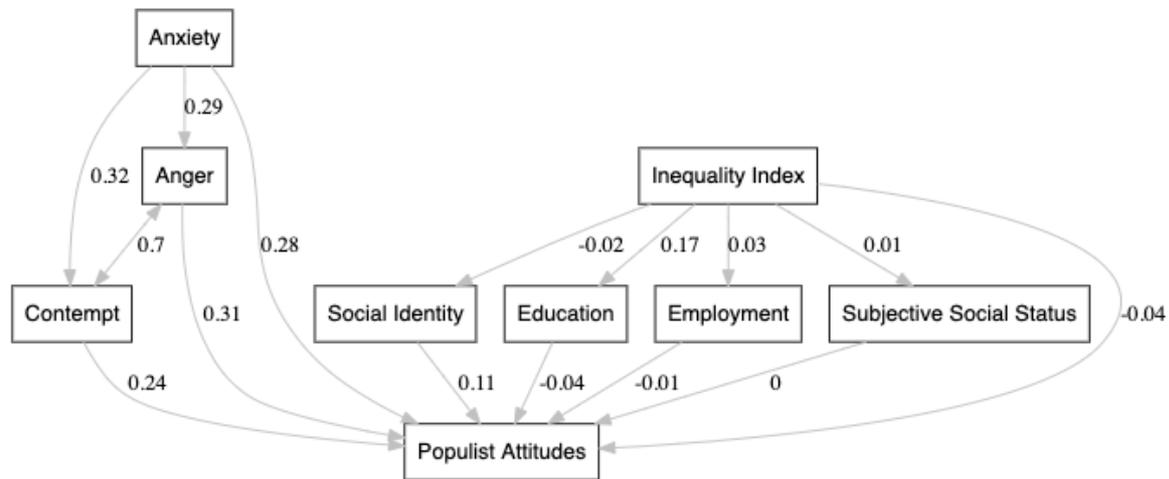


Figure 3. Advanced Structural Equation Model (standardized; N=8059). Double-headed arrows = residual covariance paths; single-headed arrows = regressions paths.

In this advanced SEM model (Figure 3), the added socio-economic and socio-cultural factors mediate the effect of the *Inequality Index* towards *Populist Attitudes*, but in contrast to the basic SEM model, many of these effects were non-significant. In fact, only *Education* had a significant mediation effect. Moreover, all these effects were negative, both indirect and direct, with no *inconsistent mediation* as found in the basic SEM model (Figure 2), making the total (indirect + direct) effect from *Inequality Index* significant, although rather small ( $\beta = -.05$  standardized), as well as negative. On the other hand, the effects of emotional factors on *Populist Attitudes* are positive; the total effect from *Anxiety* mediated by *Anger* and *Contempt* is significant and large in comparison with socioeconomic factors ( $\beta = .447$  standardized).<sup>6</sup> Overall, the explained (standardized) variance for the model of *Populist Attitudes* was 0.446 in this case, only 0.019 larger than our basic SEM model (Figure 2), showing that neither

<sup>6</sup> These mentioned standardized values stem from the mediation analysis and represent the combined effect (direct and indirect) and are therefore not shown in any SEM models, while the latter show direct effects only.

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socio-economic nor socio-cultural factors do contribute much in explaining *Populist Attitudes*, while emotional factors do.

If we re-specify our advanced SEM model (Figure 3) by removing variables suggested by the *Wald Test*, since the paths from *Employment* and *Subjective Social Status* to *Populist Attitudes* were non-significant, we get a new advanced SEM model (Figure 4), with partly improved fit indices: chi-square (9) = 150.841,  $p < .001$ , chi-square/degrees of freedom = 16.67, CFI = .988, RMSEA = .044 with the 90% confidence interval [.038–.051], and SRMR = .027. Again, the only issue is the significance of the chi-square. The explained variance ( $R^2$ ) for *Populist Attitudes* only decreased by 0.001, confirming that *Employment* and *Subjective Social Status* were non-relevant.

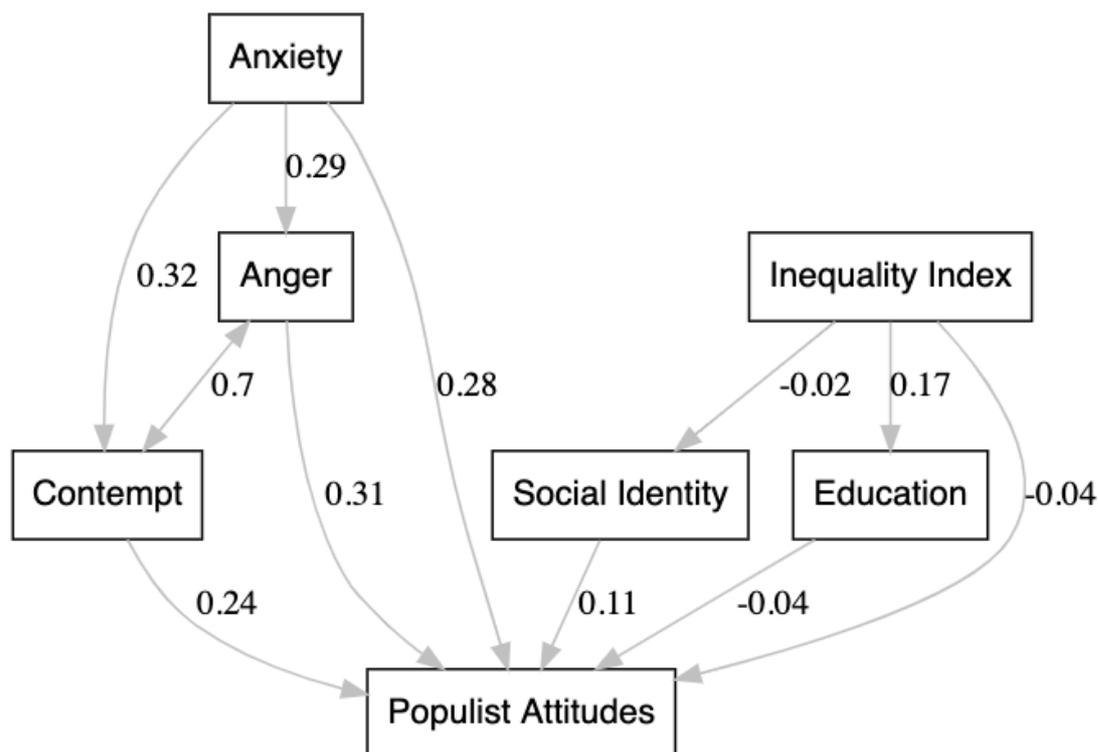


Figure 4. Wald Test for the Advanced Structural Equation Model (standardized; N=8059). Only significant paths with a p-values smaller than 0.05 depicted (double-headed arrows = residual covariance paths; single-headed arrows = regressions paths).

Due to our large sample size (N=8059) the fit estimates of this SEM model are sufficient, but still poor (see Wolf, Harrington, Clark, & Miller, 2013). Therefore, we tested the same SEM model against a smaller independent random sample (N=403) equally distributed across 15 countries, resulting in the slightly improved fit indices: chi-square (9) = 12.460,  $p = .189$ , chi-square/degrees of freedom = 1.38, CFI = .994, RMSEA = .031 with the 90% confidence interval [.000–.068], and SRMR = .028. These results prove that the large sample size (N=8059) had affected the significance of our previous results. Moreover, the total effect of *Inequality Index* and the mediation by socio-economic and socio-cultural factors became non-significant, while the explained variance ( $R^2$ ) for *Populist Attitudes* remained in a similar range (0.420), further confirming our earlier SEM models.

### Random Forest Prediction

At this step, our rationale was to test and confirm our previous *deductive* SEM models and to complement it with an *inductive* machine learning algorithm, without deploying any preconceived assumptions regarding our hypotheses. This implies that the algorithm does not know and has not previously used our above-mentioned advanced SEM models. We applied the *supervised* machine learning algorithm *Random Forest* (RF), in order to train a classifier model and to predict *Populist Attitudes*, while removing the variables/features directly correlated to it. RF is considered as a modern methodology in behavioral and psychological research (e.g., Orrù, Monaro, Conversano, Gemignani, & Sartori, 2020).

RF describes a large-scale (supervised) machine learning experiment and is defined as a meta estimator and regressor, which fits an amount of *classifying decision trees* on various sub-samples of the dataset (see also *scikit-learn* machine learning kit in Python, including *RandomForestClassifier* and *RandomForestRegressor*<sup>7</sup>). RF algorithm uses so-called

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<sup>7</sup> For more technical details see 3.2.4.3.1. `sklearn.ensemble.RandomForestClassifier` and 3.2.4.3.2. `sklearn.ensemble.RandomForestRegressor`: <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestClassifier.html>; <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestRegressor.html>.

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*Bagging* (or *Bootstrap Aggregation*), which consists of building multiple different decision tree models from a single training dataset by repeatedly using multiple bootstrapped subsets of the data and averaging the models (Lee, Ullah, & Wang, 2020). This means that at each splitting step of the tree algorithm, a random sample of  $n$  predictors is chosen as split candidates from the full set of predictors. *RF* can be used for both classification (predicting a categorical variable) and regression (predicting a continuous variable) (Bruce & Bruce; 2017; James, Witten, Hastie, & Tibshirani, 2017, p.18).

We split the data in order to have a training set with 70% of the original data and 30% as test set, since we are not performing any hyperparameter tuning due to the fact we are interested in the feature importance we had no need for a validation set. At computing *RF* regression trees, the prediction error is measured by the *root mean square error* (RMSE) on the test set containing 30% of the data, which corresponds to the average difference between the observed known values of the outcome and the predicted value by the model. The lower the RMSE, the better is the prediction model. The overall RMSE for the test set amounts to 0.58, which displays how the model is able to approximately capture the pattern of the scale *Populist Attitudes*, showing a high variance and implying the error size. Table 3 displays results (normalized values) for 10 test-respondent predictions by applying RF. For example, for test-sample 7 the (actual) Gold value for *Populist Attitudes* is 0.010301, while the model predicted it as 0.009417, which is remarkably close, considering that our RF model has neither known this test-respondent before, nor previously deployed the variables as listed in the feature importance plot.

Table 3

*Random Forest Prediction (10 tests) and Absolute Errors (normalized values)*

<b>Tests</b>	<b>Predictions</b>	<b>Gold Values</b>	<b>Errors</b>
0	0.166109	0.195487	0.029378
1	0.044629	0.047338	0.002709

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2	0.115146	0.380672	0.265525
3	-0.03514	0.047338	0.082479
4	-0.035216	0.047338	0.082554
5	0.151051	0.121412	0.029639
6	0.020668	-0.082291	0.102959
7	0.009417	0.010301	0.000884
8	-0.022655	0.065857	0.088512
9	-0.101012	-0.063773	0.037239

Overall, our prediction results were sufficient enough for the sample since our aim is not to use the *RF* model as a predictor, but rather to consider the feature importance plot. Figure 5 shows how *Anger*, *Contempt* and *Anxiety* (emotional factors) present the most important features in predicting *Populist Attitudes* across our survey dataset, which is consistent with our SEM analysis results from previous sections.

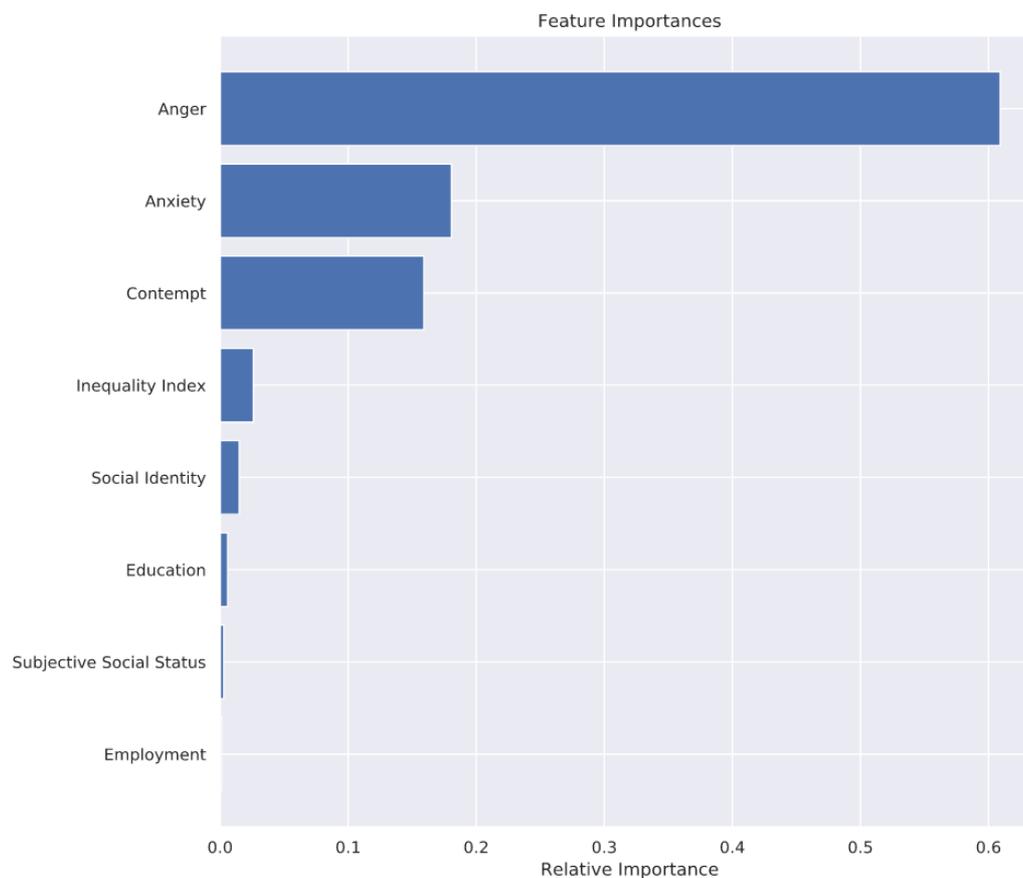


Figure 5. Random Forest Prediction (Relative Importance of Variables).

### Discussion

Previous research on populism has mainly tested one type of explanation simultaneously. In this study, we scrutinized the relative importance of different explanations of populist attitudes simultaneously. We included predictors tapping socio-economic explanations, both at the country level and at the individual level, as well as socio-cultural explanations and emotions. By applying SEM models, we found compelling evidence for the relative strong impact of emotional factors on populist attitudes, whereas socio-economic and socio-cultural factors did not add much in explaining variance in populist attitudes. In order to further back up our findings based on SEM, an *inductive* machine learning algorithm, *Random Forest* (RF), reaffirmed the importance of emotions, relative to socio-economic and socio-cultural factors, by ascribing them a much larger weight in predicting populist attitudes.

Our results thus confirm recent theorizing and research that populism is better predicted by (negative) emotions (e.g., Aslanidis, 2020; Nguyen, 2019; Salmela & von Scheve, 2017; Wirz et al., 2018) than by objective socio-economic factors (Rooduijn & Burgoon, 2018) or socio-cultural explanations (e.g., Brown, 2000; Hogg, 2001a, 2001b). Our basic SEM model, testing emotions as mediators between inequality at the country level, explained populist attitudes to a reasonable degree, and our advanced SEM model, which also included socio-economic and socio-cultural factors, did not explain any added variance above and beyond emotions in predicting populist attitudes. Furthermore, our advanced SEM model showed that socio-economic factors mediated the effect of inequality on populist attitudes, however, many of these effects were non-significant, whereas emotional factors were the most effective in explaining populist attitudes. Thus, emotional factors are indeed the main factor that predicts populist attitudes, while socio-economic factors, due to their low explained variance ( $R^2$ ), did not play a major role as mediators of inequality or as direct predictors of populist attitudes.

In addition, in contrast to previous research (Rico et al., 2017; 2020), we provide empirical evidence that all three negative emotions play an important role in explaining populist attitudes, and although *Anxiety* did play a major role, *Anger* and *Contempt* also appear to be important, as recently suggested by Nguyen (2019). These emotions are likely to reflect people's negative feelings about their current socio-economic or socio-cultural status. In other words, individuals who regularly experience certain emotions are likely to interpret one's own socio-economic situation or position in society according to similar dimensions of threat, unfairness, frustration or derogation (see Lerner et al., 2015).

An alternative explanation for the strong relation between emotions and populist attitudes could be that some items used in our scales for measuring emotions resemble items measuring populist views of survey respondents. Checking the overlap in meanings of the items in both scales, however, we do not believe that the similarity is substantial. Only the *Anti-Elitism* scale may contain implicit *Anger* items, such as 'quite a few of the people running the government are crooked', however this scale did not correlate stronger with the *Anger* or *Contempt* items than other scales, hence we do not believe that this alternative interpretation holds.

### **Research Limitations**

One clear strength of this study is that it includes a large, representative and diverse sample from 15 different European countries, testing different types of explanations. However, we should also acknowledge some limitations. The first is the marginal reliability score of our *Populist Attitudes* scale (Cronbach's  $\alpha = .66$ ), which is explained by the differences between countries in the Cronbach's Alpha's ( $\alpha$ ) for this scale. These differences are not explored in our research, because our current analysis does not focus on cross-national differences. Another limitation could be the *social desirability bias* of survey respondents, which has especially been identified for constructs, such as the need for

affiliation, conformity, approval, or (lack of) self-disclosure (Johnson & Van de Vijver, 2003). For our present research, it could apply to the emotion items, however, we phrased questions about negative emotions towards the government as a statement about the opinion of other people rather than their own feelings. In addition, we included reversed and positive emotions, and randomized all questions within the same scale.

We should also note that our (SEM analysis) measures do not clearly differentiate between various types of populism, such as left- and right-wing populism, across different countries. Therefore, we cannot determine how much of the explained variance ( $R^2$ ) for populist attitudes stems from left- and right-wing voters.

### **Future Research**

We hope to inspire other researchers to focus more on emotional factors when examining populism. As a means to bridge our SEM study with future research, we recommend to complement explanatory modeling with predictive modeling, such as computational experiments and deep learning algorithms, and to deploy experimental designs to further test the causal mechanisms behind populism.

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