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National narcissism and support for anti-vaccination policy:

The mediating role of vaccination conspiracy beliefs

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Abstract

We investigate the relationship between vaccination hesitancy and the way people feel about their national groups. Anti-vaccination attitudes are associated with conspiracy beliefs, which have been linked to group-based defensiveness. Thus, we hypothesized that defensiveness about one's national identity, operationalized as collective narcissism measured in relation to one's national group, might be related to anti-vaccination attitudes. We found that national narcissism, but not national identification, predicted the support for a voluntary vaccination policy both in a general population sample ($N=361$), and among visitors of anti-vaccination discussion forums ($N=178$). In two further studies, involving national quota samples, national narcissism was also related to vaccination conspiracy beliefs ($N=1048$), and these beliefs mediated its association with support for a voluntary vaccination policy ($N=811$). By highlighting the link between anti-science attitudes and collective narcissism, we demonstrate that group defensiveness can be linked to support for decisions that may undermine the health and well-being of present and future ingroup members.

Keywords: ingroup identification, collective narcissism, anti-vaccination, vaccinations conspiracy beliefs, public policies

National narcissism and support for anti-vaccination policy:

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Vaccination saves the lives of millions of people every year (WHO, 2020). Despite the scientific consensus about the many health advantages of vaccination, the anti-vaccination movement has been rising again in many countries, just as in the XIX and early XX century (Wolfe, 2002). One consequence of the growing vaccination hesitancy is the recent increase in incidences of communicable diseases, such as mumps or measles, which had been considered eradicated by modern medicine (Gangarosa et al., 1998; McBrien et al., 2003; Phadke et al., 2016). Vaccination policies adopted by countries vary. In some countries (e.g., Eastern European countries, France, Italy, etc.), vaccination is mandatory, usually for children, but there is variation in the lists of mandatory vaccines and sanctions for not vaccinating. Other countries offer a variety of non-medical exemptions (e.g., religious or philosophical). Finally, some countries adopt a voluntary vaccination policy, that is they allow individuals to make their own decision as to whether vaccinate themselves and their children, without the state mandating vaccination and sanctioning non-vaccination (Vaz et al., 2020; Walkinshaw, 2011).

Within states that have introduced mandatory vaccination policies most citizens seem to support it, but there is still a considerable variability in attitudes toward compulsory vaccination (Gualano et al., 2019). Some of the anti-vaxx groups actively contest it and strive to introduce a voluntary vaccination policy, because they believe that vaccinations might create health hazards. Examples include the #stopnop movement in Poland or the anti-vaxxers movement in Italy supported by the Italian health minister Giulia Grillo (De Benedetti, 2018). Importantly, social support for anti-vaccination policies may affect legislation (De Benedetti, 2018; Komisja Zdrowia oraz Komisja Polityki Społecznej i Rodziny, 2018) and only too easily translate into unstable or delayed vaccination programs (Vrdelja et al., 2020) which

would eventually undermine public health. As such, the anti-vaccination movement was listed by the World Health Organization (2019) as one of the top ten world health threats.

Psychological antecedents of anti-science attitudes

Here, we aim to investigate anti-vaccination attitudes as an example of anti-science orientation with potentially grave real-world consequences. Scientists have been trying to understand the reluctance toward vaccinating children and adults in hope of increasing immunization (Brewer et al., 2017; Larson et al., 2014). Since the time vaccines were first applied, their use has only too frequently been accompanied by protests and anti-vaccination movements in various societies and communities (Wolfe, 2002). Interventions based on offering scientific evidence proved not only to be ineffective, but sometimes even counter-effective, ultimately reducing vaccination intentions (Nyhan et al., 2014). This is because anti-science attitudes are not merely an effect of misinformation—they are often motivated (Hornsey et al., 2018a; Nyhan et al., 2014). Hence, anti-vaccination attitudes cannot be easily explained by informational deficits—those who hold anti-vaccination attitudes are neither less educated (Larson et al., 2014), nor do they spend less time seeking information about vaccines (Jones et al., 2012).

A report of the Strategic Advisory Group of Experts on Immunization (The SAGE Working Group, 2014) highlights safety concerns, perceived lack of vaccine benefits, science denialism and lack of trust in health authorities and providers as the motives behind the support for the anti-vaccination movement. Anti-vaccination sentiments are effectively proliferated by prominent political figures, including the US President Donald Trump (Hornsey et al., 2020). For instance, in 2014, he tweeted: “I am being proven right about massive vaccinations—the doctors lied. Save our children & their future” (Trump, 2014). Such messages might contribute to the spread of anti-vaccination conspiracy theories, which

usually accuse pharmaceutical companies, governmental agencies and scientists of withholding risks associated with vaccination from the public (e.g., Jolley & Douglas, 2014). In fact, holding conspiracy vaccination beliefs seems to be the psychological motive most strongly related to anti-vaccination attitudes (Hornsey et al., 2018a). Similarly, conspiracy beliefs were linked to other anti-science attitudes, such as climate skepticism (Lewandowsky et al., 2013, although this effect seems to be robust only in the US context; Hornsey et al., 2018b).

Summing it up, past research showed that anti-science attitudes, including anti-vaccination ones, are associated with conspiracy beliefs. Conspiracy theories explain impactful events or circumstances as secret acts of powerful malevolent groups (Douglas et al., 2017; 2019), and as such tend to be fueled by group-based defensiveness. Therefore, while past work on anti-vaccination attitudes has almost exclusively focused on individual-level factors (such as reactance, needle sensitivity, or individualistic worldviews, e.g. Hornsey et al., 2018a; Taddio et al., 2012), we focus on group-processes associated with belief in anti-vaccination conspiracy theories and opposition to obligatory vaccination policies. We propose that national narcissism (capturing defensiveness about one's national identity) can be a risk factor shaping anti-vaccination attitudes insofar as it is associated with the endorsement of vaccination conspiracy theories.

National narcissism and vaccination hesitancy

Feelings of group attachment as important manifestations of humans' social life (Tajfel & Turner, 1986) may take different forms (Ashmore et al., 2004; Cameron, 2004; Luhtanen & Crocker, 1992). Classic theorizing and contemporary empirical research differentiated between secure and defensive forms of ingroup positivity (see Cichocka, 2016 for review). One particular instance of defensiveness, which is applicable to diverse group

contexts, is collective narcissism: an attitudinal orientation capturing individuals' belief in ingroup greatness associated with the need for external validation (Golec de Zavala et al., 2009). According to classic works of Adorno (1963/1998) and Fromm (1973) this idealization of ingroup compensates individual shortcomings. Indeed, research shows that collective narcissism is associated with generally low feelings of self-worth (Golec de Zavala et al., 2020) and it increases when personal control is threatened (Cichocka et al., 2018; see also Marchlewska et al., 2020). Importantly, collective narcissism was found to be a robust and unique predictor of political beliefs and decisions (Cislak et al., 2020; Federico & Golec de Zavala, 2018; Marchlewska et al., 2018), as well as intergroup outcomes such as generalized intergroup hostility and sensitivity to intergroup threats (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016; Golec de Zavala et al., 2009; Golec de Zavala, Cichocka, & Bilewicz, 2013; Golec de Zavala, Cichocka, & Iskra-Golec, 2013).

Because collective narcissism assumes a positive evaluation of the ingroup, it was found to be also moderately positively correlated with conventional measures of ingroup identification (e.g., Cichocka, 2016; Golec de Zavala et al., 2009). However, once their overlap is co-varied out, we can observe the effects of a more secure, non-narcissistic identification. Past work showed that its effects are different from the effects of collective narcissism: after controlling for collective narcissism, ingroup identification predicted more favorable out-group attitudes and lower sensitivity to threats (Cichocka et al., 2018; Golec de Zavala, Cichocka, & Bilewicz, 2013; Marchlewska et al., 2020).

We argue that group-based defensiveness, captured by collective narcissism, is associated with anti-science attitudes (such as anti-vaccination). We investigate this relationship in the context of national groups. Accordingly, we refer to collective narcissism measured in relation to one's nation as national narcissism. There are several plausible reasons why national narcissism might be linked to vaccination hesitancy. The first potential

mechanism could be that the belief in the nation's greatness is associated with the conviction that the ingroup is invulnerable and, thus, may live and prosper even without additional medical protection. As an example, President of Brazil in the midst of Covid-19 pandemic claimed his compatriots "never catch anything" (Phillips, 2020, para. 5). Thus, any undesirable consequences of the anti-vaccination movements would be seen as impossible to happen, thereby fueling vaccination hesitancy. Challenging this potential mechanism, however, past work showed that collective narcissism is positively related to increased, rather than decreased, perceptions of threats to the ingroup (Golec de Zavala et al., 2009; Golec de Zavala et al., 2016).

Second, it is possible that because national narcissism is linked to increased support for populist leaders (Marchlewska et al., 2018), the medical populist messages (Lasco & Curato, 2019; Hornsey et al., 2020) shape vaccination readiness of those high in national narcissism more strongly than of those low in national narcissism. Recent findings on the role of elite cues (e.g., in shaping climate change attitudes) show that while providing scientific information has a limited impact on public concerns, elite cues and mobilizing public opinion through political advocacy groups are critical (Carmichael & Brulle, 2017). This might imply that high national narcissism in itself does not make people more prone to adopt anti-vaccination attitudes in a bottom-up process, but that this relationship reflects a top-down process where national narcissism becomes a risk factor when prominent political actors decide to propagate anti-vaccination attitudes. However, it is equally possible that populist leaders, rather than strive to set the agenda, prefer to propagate messages that are likely to resonate with their constituencies in hope of mobilizing political support. As an example, the Polish President Andrzej Duda in July 2020 famously pro-claimed himself to be vaccine-hesitant (Kosc, 2020) during a critical stage of his presidential campaign, when his advantage over his main rival Rafał Trzaskowski was decreasing.

The third potential mechanism fueling vaccine hesitancy among those high in national narcissism could be the image threat sensitivity. Past work demonstrated that collective narcissism predicted hypersensitivity to ingroup criticism (Golec de Zavala et al., 2016), defensive reactions to threats (Golec de Zavala, Cichocka, & Iskra-Golec, 2013; Marchlewska et al., 2020), and an extensive need to resist external pressures on the group (Cislak et al., 2018; 2020). This threat sensitivity also means that collective narcissism is associated with predisposition for belief in conspiracy theories (Cichocka, Marchlewska, & Golec de Zavala 2016). In the context of anti-vaccination conspiracies, resisting influence from high-status groups, such as scientists, or wealthy groups, such as pharmaceutical corporations may be a way of maintaining a strong ingroup image in the eyes of others. Overall, we predict that national narcissism is associated with vaccination hesitancy through conspiracy beliefs—one of key factors associated with anti-vaccination attitudes (Hornsey et al., 2018a).

National narcissism and anti-vaccination conspiracy beliefs

Conspiracy beliefs often assume an intergroup dimension, indicating that a group of people outside or within one's own group is conspiring against it (e.g., van Prooijen & van Lange, 2014). In this latter case, conspiracy theories identify a small group of wrongdoers, who do not necessarily represent ingroup members, but are thought to work for corrupt elites or corporations willing to undermine the ingroup to realize their own interests (Jolley et al., 2018). We argue that this is why anti-vaccination conspiracy theory beliefs are likely to be predicted by national narcissism.

Conspiracy beliefs can be motivated by attempts to restore feelings of self-worth and social status by blaming others for one's misfortunes (Abalakina-Paap et al., 1999; Goertzel, 1994; Robins & Post, 1997). In line with this idea, conspiracy theories are fueled by both personal and group-based defensiveness (Biddlestone et al., 2020; Douglas et al., 2017),

which can be operationalized as individual and collective narcissism, respectively. Cichocka, Marchlewska, and Golec de Zavala (2016) showed that individual narcissism positively predicted generic conspiracist beliefs (Brotherton et al., 2013), including the beliefs that scientists manipulate the public or that experiments involving new drugs are routinely carried out on the public without their knowledge.

Extensive research has also shown robust associations between conspiracy beliefs and collective narcissism (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016; Golec de Zavala, & Cichocka, 2012; Golec de Zavala & Federico, 2018; Marchlewska et al., 2019, 2020). For instance, research conducted in the context of religious identities showed that Catholic narcissism predicted a conviction that certain social movements and activists conspire to undermine traditional social arrangements (the so called “gender-conspiracy”; Marchlewska et al., 2019). Further, several studies focused on the role of national narcissism in predicting beliefs in various conspiracy theories, especially those implicating members of other (rather than own) groups (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). National narcissism was associated with beliefs in conspiracy theories about other nationalities (e.g., Jews; Golec de Zavala & Cichocka, 2012), foreign governments (Cichocka Marchlewska, Golec de Zavala, & Olechowski, 2016), or causes of important events (such as the fall of Berlin Wall or the Smolensk catastrophe; Cichocka, et al., 2015; Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). However, national narcissism also was found to predict beliefs that certain influential political groups conspire within the nation (Golec de Zavala & Federico, 2018). Importantly, in the public health context, national narcissism was found to be linked to both the endorsement and the dissemination of conspiracy beliefs regarding the COVID-19 pandemic as opposed to the endorsement or the dissemination of factual information on COVID-19 (Sternisko et al., 2020). Overall, for those high in collective narcissism, beliefs in conspiracies both outside and within their own groups

seem to serve as an accessible explanation for the alleged disadvantage of their ingroup, thereby enabling them to maintain a positive ingroup image (Cichocka, Marchlewska, & Golec de Zavala, & Olechowski, 2016).

Overview

In a series of four studies, we investigate the relationship between vaccination hesitancy and the way people feel about their national groups. Our primary hypothesis is that national narcissism would be associated with anti-vaccination attitudes. First, we predicted a positive effect of national narcissism on support for introducing a voluntary vaccination policy. Second, we predicted that this effect should be mediated by vaccination conspiracy beliefs. We expected opposite effects for national identification.

In all of the studies we measured national narcissism and national identification as predictors. In Studies 1 and 2, we measured the support for a voluntary vaccination policy as the dependent variable. In Study 3, conducted on a national quota sample of youth, we measured beliefs in vaccination conspiracy theories as the dependent variable. In Study 4, also conducted on a general national quota sample, we tested the full model including national narcissism and national identification as predictors, beliefs in vaccination conspiracy theories as the mediator and the support for a voluntary vaccination policy as the dependent variable.

In Studies 2 and 3, we also measured individual narcissism. Individual narcissism tends to correlate positively with collective narcissism (e.g., Golec de Zavala et al., 2009) and has previously been linked to conspiracy beliefs (Cichocka, Marchlewska, & Golec de Zavala, 2016). Controlling for the effects of individual narcissism allowed us to examine the unique effects of group versus individual defensiveness.

As past work suggested that both anti-vaccination attitudes (Rabinowitz et al., 2016), and national narcissism (Cichocka et al., 2017; Golec de Zavala et al., 2009) are associated

with right-wing political orientation, in all of the studies we also measured and controlled for political ideology. Data for all four studies are available at the Open Science Framework: https://osf.io/3kacz/?view_only=cb3437fb8b2c43148fcdf268d655e57f.

Study 1

Study 1 sought to examine the basic relationships between national narcissism versus identification and vaccination policy support.

Method

Participants and procedure. In Study 1 we recruited 361 Polish internet users with the help of a research panel. The sample included 133 women (coded as 1) and 228 men (coded as 0), aged between 18 and 77 ($M=43.11$; $SD=14.36$). We measured national narcissism and national identification as predictors of support for a voluntary vaccination policy. We also measured political orientation as well as basic demographics¹.

Measures.

National narcissism was measured with a short 5-item version of the Collective Narcissism Scale (Golec de Zavala et al., 2009) measured in relation to the national group. Participants indicated to what extent they agreed with the statements, such as “I will never be

¹ Beside the variables reported here, Study 1 also involved measures of support for anti-environmental policies and conspiracy intentions included for the purposes of different projects employing the same predictors. Support for anti-environmental policy was included for the sake of a (successful) conceptual replication of past findings (Names Blinded, 2018), while conspiracy intentions were included for the purpose of a future project, yet unpublished (please contact the first author for details). The materials received by these participants did not include any other measures.

satisfied until Poles gets all they deserve”, “It really makes me angry when others criticize Poles”, “If Poles had a major say in the world, the world would be a much better place”, on a scale from 1 (definitely not) to 7 (definitely yes), $\alpha=.92$, $M=4.45$, $SD=1.55$.

National identification was measured with a short 5-item version (Cislak et al., 2018) of the Social Identification Scale (Cameron, 2004). Participants responded to items (e.g. “I have a lot in common with other Poles”, “I feel strong ties to other Polish people”, “In general, I’m glad to be Polish”) on scales from 1 (definitely not) to 7 (definitely yes), $\alpha=.85$, $M=5.23$, $SD=1.30$.

Support for a voluntary vaccination policy was measured with 3 items: “I support the introduction of a law on voluntary vaccination in Poland”, “The law on voluntary vaccination is needed by our State”, “If I could vote today in a referendum regarding voluntary vaccination, I would support it”. Participants responded on a scale from 1 (definitely not) to 7 (definitely yes), $\alpha=.94$, $M=2.83$, $SD=2.01$.

Political orientation was a single-item measure, with a scale from 1= *definitely left-wing* to 7= *definitely right-wing*, $M=4.00$, $SD=1.41$.

Results

Zero-order correlations. We first computed correlations between continuous variables². National narcissism and national identification were significantly positively correlated with each other and with political orientation. Support for a voluntary vaccination policy was also positively correlated with national collective narcissism but uncorrelated with national identification (Table 1).

² Across the paper, we report 95 % confidence intervals based on bootstrapping with 1,000 resamples.

----- Table 1 -----

Support for a voluntary vaccination policy. We were primarily interested in examining whether national collective narcissism and national identification were differently associated with the support for voluntary vaccination policy. Thus, we examined the regression model with national narcissism and national identification as predictors of the support for introducing a voluntary vaccination policy. The model was significant. As predicted, individuals higher in national narcissism declared stronger support for a voluntary vaccination policy. After controlling for national narcissism, national identification was negatively associated with the support for a voluntary vaccination policy. As illustrated in Table 2, the effect of national narcissism on the support for a voluntary vaccination policy remained significant after controlling for demographics and political orientation.

----- Table 2 -----

Discussion

Study 1 showed that national narcissism and national identification were positively correlated, yet showed opposite effects: while national narcissism was positively associated with the support for a voluntary vaccination policy, national identification predicted this outcome negatively. These effects were demonstrated over and above the effects of right-wing political orientation which, in line with past work (Rabinowitz et al., 2016), was positively related to anti-vaccination attitudes. This study provided the first evidence that national narcissism is related to the support for changing a mandatory, state-financed vaccination program, thereby creating a hazard to both children's well-being and public health more broadly. This implies that, in contrast to high ingroup identifiers, those high in collective narcissism are prone to support public policies that may ultimately undermine the well-being of their own group (see also Cichocka & Cislak, 2020; Cislak et al., 2018).

Study 2

The aim of Study 2 was two-fold: we aimed to replicate the effects observed in Study 1 and to verify whether these effects operate over and above the effects of individual narcissism. This time we recruited participants among users of private Polish Facebook discussion forums that featured anti-vaccination topics. We first pre-screened forums looking for those which descriptions fitted the anti-vaccination theme. One of the team members then requested to join these groups, and distributed the link to the study among the users of four discussion groups that accepted the request: “Undesirable vaccine symptoms – true stories”, “Awareness of development, development of awareness”, “The world has woken up”, and “Global awareness”. We did not pre-screen participants for their own vaccination attitudes. Study 2 also employed full, longer versions of the scales used in Study 1.

Method

Participants and procedure. Study 2 was an online survey. Following the recommendations of (Vazire, 2015), we aimed for a sample size that would provide 80% power to detect the effect of r of .21—a typical effect in social/personality psychology (Richard et al., 2003). Using GPower, we estimated the target sample size to be at least 173 or larger. We asked only adults to participate, but despite the direct instruction, six participants who completed the questionnaire declared to be underage. Because we could not use the data of these six participants, we had to top-up the sample after the initial data collection was completed, in order to reach the 173 target. Final analyses included only these participants who provided responses to at least one item regarding the voluntary vaccination policy. The final sample consisted of 178 participants, 128 women and 48 men (2 respondents declined to indicate their gender), aged between 18 and 69 ($M=24.87$; $SD=8.48$).

Measures.

National narcissism was measured with all nine items of the Collective Narcissism Scale (Golec de Zavala et al., 2009), $\alpha=.82$, $M=3.28$, $SD=1.09$.

National identification was measured with the full 12-item Social Identification Scale (Cameron, 2004), $\alpha=.93$, $M=4.07$, $SD=1.34$.

Individual narcissism was measured with the six-item version of the Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013), e.g., “I deserve to be seen as a great personality” (Admiration Subscale; $\alpha=.81$, $M=3.27$, $SD=1.46$) or “I want my rivals to fail.” (Rivalry Subscale, $\alpha=.64$, $M=3.01$, $SD=1.40$).

Support for a voluntary vaccination policy was measured with nine items, including those used in Study 1. Participants responded on scales from 1 (definitely not) to 7 (definitely yes), $\alpha=.95$, $M=2.42$, $SD=1.66$.

Political orientation was the same single-item measure as in Study 1, $M=3.55$, $SD=1.20$.

Results

Zero-order correlations. Again, we first computed correlations between continuous variables. National narcissism and national identification were significantly positively correlated to each other and to political orientation. Support for a voluntary vaccination policy was also positively correlated to national narcissism, national identification and right-wing political orientation (Table 3).

----- Table 3 -----

Support for a voluntary vaccination policy. We then examined the regression model with the support for introducing a voluntary vaccination policy as the dependent variable. In

the first step, we introduced national narcissism and national identification as predictors. The model was significant. As predicted, individuals higher in national narcissism declared stronger support for a voluntary vaccination policy. After controlling for national narcissism, national identification was not significantly related to the support for a voluntary vaccination policy. Importantly, the effect of national narcissism on the support for a voluntary vaccination policy remained significant after controlling for individual narcissism which was unrelated to the dependent variable. Neither narcissistic seeking for admiration, nor narcissistic rivalry predicted the anti-vaccination attitudes. As illustrated in Table 4, after additionally controlling for demographics and right-wing political orientation, the effect of national narcissism on the support for a voluntary vaccination policy was marginally significant.

----- Table 4 -----

Discussion

In Study 2, national narcissism, but not national identification, predicted positively the support for a voluntary vaccination policy, although this effect was marginally significant after controlling for individual narcissism, political orientation and demographics. Interestingly, despite past work (Hornsey et al., 2018a) showing the role of individualistic worldviews in shaping vaccination attitudes, we did not observe a significant relationship between individual narcissism and the support for anti-vaccination policy.

Study 3

In Study 3, we tested the hypothesis that national narcissism would positively predict vaccination conspiracy beliefs, while national identification would predict this outcome negatively. Additionally, we aimed to verify whether these effects would be observed even when we controlled for the effects of individual narcissism. Recent research showed that a

growing number of young people feel the vaccines are unnecessary and harmful (Dickson, 2020). In fact, adolescents have little recollection of what the world was like when citizens were powerless against now rare (but re-emerging) diseases, such as pneumonia or measles. For this reason, in Study 3 we relied on a national quota sample of young Poles (balanced for gender, age and size of residence).

Method

Participants and procedure. Study 3 was conducted on a representative sample of young Poles via an online research panel. The final sample consisted of 1048 participants, 547 women and 501 men, aged between 18 and 25 ($M=22.35$; $SD=2.16$). We measured national narcissism and national identification as predictors and vaccination conspiracy beliefs as the dependent variable. As previously, we also measured basic demographics and participants' political orientation and individual narcissism³.

Measures.

National narcissism was measured with five items of the short Collective Narcissism Scale (Golec de Zavala, Cichocka, & Bilewicz; 2013). Participants responded on scales from 1 (definitely disagree) to 5 (definitely agree) $\alpha=.87$, $M=2.86$, $SD=0.86$.

National identification was measured with a shortened three-item Social Identification Scale (Cameron, 2004, see also Górska et al., 2020). Participants responded on scales from 1 (definitely disagree) to 5 (definitely agree), $\alpha=.88$, $M=3.29$, $SD=0.87$.

Individual narcissism was measured with a nine-item version of the narcissism

³ Beside the variables reported here, Study 3 also involved measures of political engagement and a set of individual differences variables included for the purposes of different projects employing the same predictors (please contact the second author for details).

subscale taken from the Short Dark Triad scale (SD3; Jones & Paulhus, 2014; see also Rogoza & Ciecuch, 2019 for Polish version), e.g., “I insist on getting the respect I deserve” or “I know that I am special because everyone keeps telling me so.” ($\alpha=.68$, $M=2.71$, $SD=0.60$).

Vaccination conspiracy beliefs were measured with five items previously used by Jolley and Douglas (2014): “Vaccines are harmful, and this fact is covered up,” “Tiny devices are placed in vaccines to track people,” “Pharmaceutical companies, scientists and academics work together to cover up the dangers of vaccines,” “The government is trying to cover up the link between vaccines and autism,” “The flu vaccine allows the government to monitor the elderly through the implantation of tiny tracking devices.” Participants responded on scales from 1 (definitely disagree) to 7 (definitely agree), $\alpha=.94$, $M=2.18$, $SD=1.08$.

Political orientation was the same single-item measure as in Study 1, $M=3.93$, $SD=1.40$.

Results

Zero-order correlations. National narcissism and national identification were significantly positively correlated with each other and with individual narcissism and political orientation. Vaccination conspiracy beliefs were also positively correlated with national narcissism, individual narcissism and with political orientation (Table 5).

Vaccination conspiracy beliefs. We aimed to examine whether high national narcissism and high national identification were differently associated with vaccination conspiracy beliefs, when their overlap was controlled for. Thus, we examined the regression model with national narcissism and national identification as predictors of vaccination conspiracy beliefs. The model was significant. As predicted, individuals higher in national narcissism scored higher on vaccination conspiracy beliefs. After controlling for national

narcissism, national identification was significantly negatively associated with vaccination conspiracy beliefs (see Table 6).

These effects remained significant even after controlling for demographics, right-wing political orientation and individual narcissism⁴.

----- Table 5 -----

----- Table 6 -----

Discussion

Study 3 showed that national narcissism and national identification were positively correlated, yet associated with vaccination conspiracy beliefs in opposite ways. Previous research showed that collective narcissism (both national, e.g., Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016; Sternisko et al., 2020; and religious, e.g., Marchlewska et al., 2019) served as a positive predictor of the endorsement of conspiracy theories. In this study, we found that it is also positively related to vaccination conspiracy beliefs. Possibly, in this case those scoring high in national narcissism see vaccination as imposed by enemies who might operate even within the nation (Jolley et al., 2018). National identification, on the other hand, was associated with lower vaccination conspiracy beliefs,

⁴ We asked participants two additional questions about their political orientation in terms of social and economic issues. When these two variables were entered into the regression equation instead of the one-item political ideology measure, the pattern of results was similar: vaccination conspiracy beliefs were positively related to national narcissism and individual narcissism, but negatively to national identification. However, we found a significant positive relationship only between social right-wing political orientation and conspiracy beliefs. There was no significant relationship between economic political orientation and conspiracy beliefs.

which is in line with past research indicating that more secure forms of national identification are associated with a lower likelihood of endorsing conspiracy theories (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016).

These effects were observed even when we controlled for the effects of left-right political orientation and individual narcissism. Both of these variables were positively associated with the endorsement of anti-vaccination conspiracy theories. These results are consistent with past work linking individual narcissism (Cichocka, Marchlewska, & Golec de Zavala, 2016) and political conservatism (van der Linden et al., 2020; cf. van Prooijen et al., 2015) to more generalized conspiracy beliefs, as well as with research showing that pro-vaccination attitudes are less prevalent among conservatives (Hornsey, et al., 2018a; Rabinowitz et al., 2016).

Study 4

In Study 4, we sought to replicate the effects observed in the previous studies and test the full model using a national quota sample balanced for gender, age and education. We aimed to verify whether the support for changing the vaccination policy is positively predicted by national narcissism and negatively predicted by national identification, and whether these effects are differentially mediated by vaccination conspiracy beliefs.

Method

Participants and procedure. Study 4 was an online survey. The final sample consisted of 811 participants, 418 women and 384 men (9 persons failed to indicated their gender), aged between 18 and 84 ($M=40.17$; $SD=14.16$). We measured national narcissism and national identification as predictors (counterbalanced). Vaccination conspiracy beliefs and the support for a voluntary vaccination policy were measured as the mediator and the

dependent variable respectively. As previously, we also measured basic demographics and participants' political orientation.

Measures.

National narcissism was measured with five items of the short Collective Narcissism Scale (Golec de Zavala, Cichocka, & Bilewicz; 2013), $\alpha=.90$, $M=4.30$, $SD=1.50$.

National identification was measured with the shortened 5-item Social Identification Scale (Cameron, 2004, see also Cislak et al., 2018, 2020), $\alpha=.88$, $M=5.24$, $SD=1.37$.

Vaccination conspiracy beliefs were measured in the same way as in Study 3. Participants responded on scales from 1 (definitely not) to 7 (definitely yes), $\alpha=.92$, $M=2.32$, $SD=1.48$.

Support for a voluntary vaccination policy was measured in the same way as in Study 1. Participants responded on scales from 1 (definitely not) to 7 (definitely yes), $\alpha=.96$, $M=3.01$, $SD=2.06$.

Political orientation was the same single-item measure as in other studies, $M=3.99$, $SD=1.46$.

Results

Zero-order correlations. Again, we first computed correlations between continuous variables. National narcissism and national identification were significantly positively correlated with each other and with political orientation. Vaccination conspiracy beliefs and the support for a voluntary vaccination policy were also positively correlated with each other and with national narcissism, as well as with political orientation. Although national

identification was not related to vaccination conspiracy beliefs, it was significantly positively related to the support for a voluntary vaccination policy (Table 7).

----- Table 7 -----

Model test

We then examined a path model using Mplus version 8.4 (Muthén & Muthén, 2017) to verify whether national narcissism was associated with the support for a voluntary vaccination policy through vaccination conspiracy beliefs. As illustrated in Figure 1, national narcissism predicted vaccination conspiracy beliefs significantly and positively, $b = 0.43 [0.35, 0.52]$, $p < .001$. However, when the overlap between national narcissism and national identification was controlled for, national identification was significantly negatively related to vaccination conspiracy beliefs, $b = -0.27 [-0.36, -0.19]$, $p < .001$. In turn, vaccination conspiracy beliefs significantly and positively predicted the support for a voluntary vaccination policy, $b = 0.84 [0.76, 0.92]$, $p < .001$. The indirect effect of national narcissism on the support for a voluntary vaccination policy via vaccination conspiracy beliefs was significant, estimate = 0.37 [0.29, 0.44], $p < .001$. Similarly, the indirect effect of national identification on the support for a voluntary vaccination policy via vaccination conspiracy beliefs was significant, estimate = -0.23 [-0.30, -0.16], $p < .001$. After accounting for its significant indirect effect, national narcissism had a direct positive effect on the support for a voluntary vaccination policy, $b = 0.17 [0.06, 0.28]$, $p < .001$, while the direct effect of national identification was only marginally significant, $b = 0.09, [-0.01, 0.20]$, $p = .083$. Crucially, when we adjusted for demographics and political orientation, the pattern of results for our focal predictors remained the same.

----- Figure 1 -----

Discussion

In Study 4, we found that national narcissism was significantly related to vaccination conspiracy beliefs (replicating the results of Study 3) and to the support for introducing a voluntary vaccination policy (replicating the results of Studies 1 and 2). Moreover, we found that the endorsement of vaccination conspiracy theories mediated the effect of national narcissism on supporting a voluntary vaccination policy. National identification, in contrast, was negatively associated with beliefs in vaccination conspiracy theories and, in turn, predicted lower support for a voluntary vaccination policy. As in previous studies, these relationships were observed over and above the effects of right-wing political orientation.

General Discussion

In a series of four studies, we confirmed our prediction that national narcissism would be significantly related to the support for a voluntary vaccination policy (Studies 1, 2 and 4) as well as to beliefs in conspiracy theories about vaccines (Studies 3 and 4). We further found that vaccination conspiracy beliefs mediated the effect of national narcissism on the support for a voluntary vaccination policy (Study 4). Our studies involved different samples: a general community sample (Study 1), users of discussion forums that featured anti-vaccination topics (Study 2), a national quota sample of youth (Study 3), and finally a general national quota sample (Study 4). In this way, we sought to enhance credibility and allow for making inferences with respect to the society more broadly, rather than narrow groups within it. In all studies, national narcissism explained a considerable amount of variance within support for changing the current state vaccination policy.

The effects we observed were unique to national narcissism. National identification was negatively associated with vaccination conspiracy beliefs (Studies 3 and 4) and negatively (or non-significantly) associated with the support for a voluntary vaccination policy (Studies 1, 2 and 4). Thus, we show that it is not the mere strength of ingroup positivity, but rather the group-based defensiveness that is linked to anti-vaccination attitudes.

Moreover, the effects of national narcissism were observed over and above the effects of right-wing political orientation (Studies 1-4), which in line with past work (Rabinowitz et al., 2016) was positively associated with the support for a voluntary vaccination policy. Also, when we included individual narcissism in Study 2, we found that it was not related to anti-vaccination attitudes (although in line with past work, Cichocka, Marchlewska, & Golec de Zavala, 2016, it was related to conspiracy beliefs in Study 3).

National narcissism and support for policies

These results have important theoretical and practical implications. The anti-vaccination conspiracy theory endorsed by those high in national narcissism claims that large pharmaceutical companies, together with researchers and scientists, are covering up negative information about vaccines to execute their nefarious plans and take control over the world. Validating an ingroup image through resisting influence from high-status groups, such as scientists, or wealthy groups, such as pharmaceutical corporations, however, comes at a price: a potential deterioration of the ingroup members' health and well-being. Previous research showed that those who believe in vaccination conspiracy theories are prone to avoid vaccination themselves (Jolley & Douglas, 2014). Only four years after the Global Health Security Agenda tapped Italy to lead world vaccination strategies, did Italy's interior minister Matteo Salvini, representing a populist government, follow Donald Trump in supporting the anti-vaccination movement. In the run up to the general election he stated that "ten obligatory vaccinations are useless and, in many cases, dangerous, if not harmful" (ANSA, 2018, para. 3). As we suggested above, such messages might resonate especially well with those high in national narcissism—past work identified national narcissism as a robust predictor of voting for populist parties (such as Law and Justice in Poland) and politicians (such as Donald Trump in the US; e.g., Marchlewska et al., 2018). Thus, undermining global health policies

may be exploited politically if it is used to highlight the strength and the independence of one's own national group.

Past work shows that despite being related to a narrative of fighting for the recognition for the greatness of one's own group, collective narcissism is associated with the support for policies that in the long run may turn against this ingroup (Cichocka, 2016; Marchlewska et al., 2020). For example, those high in national narcissism show higher support for anti-environmental policies such as subsidizing the coal industry or logging a unique protected forest (Cislak et al., 2018). Introducing anti-environmental policies not only deteriorates the natural environment (e.g., due to increased air pollution), but also undermines the citizens' health (European Environment Agency, 2016). Support for such policies seems to stem from the narcissistic need to make decisions independently of external influences (Cislak et al., 2018). In a similar vein, the perceived disadvantage of own nation (Marchlewska et al., 2018) or the belief that other nations gain more than one's own group (Cislak et al., 2020) linked national narcissism to the support for leaving supranational organizations such as the European Union, and thus with renouncing the benefits that these organizations offer. In the long term, such beliefs may also impact health-related behaviors, including those in times of a pandemic (such as the COVID-19 one; Van Bavel et al., 2020). Together, past and current findings suggest that collective narcissism may be a risk factor that predicts support for policies that in the long run may undermine the ingroup and the well-being of its members.

Limitations and future directions

Studies presented here reveal group-based underpinnings of anti-science attitudes using anti-vaccination attitudes as an example. Group-based defensiveness is a risk factor in maintaining public health: it is associated with the endorsement of conspiracy theories that, in turn, are linked to the support for public policies, including health policies, with undesirable

long-term national and global consequences. However, research presented here is not without limitations. First, all of our studies were correlational, making our inferences about causality limited. Second, all of the studies were conducted within one socio-political context, among Polish participants. Poland is one of 11 (out of 31 for which the data are available) European countries that has mandatory vaccines (European Centre for Disease Prevention and Control, 2020). There are as many as nine vaccines mandatory in Poland, some of which are imported and some produced locally. Until recently, the vaccination coverage has been consistently high. However, the number of vaccination avoidance cases has increased 16-fold in the last 10 years (Defratyka, 2020, analysis based on data of the National Institute of Public Health). Currently, a citizen-proposed bill introducing voluntary vaccination policy is being reviewed by the Polish Parliament (Komisja Zdrowia oraz Komisja Polityki Społecznej i Rodziny, 2018). Thus, Poland is an example of a country which managed to keep the high vaccine coverage and high levels of immunization until recently. However, this may soon change due to an active anti-vaccination movement and the wide social response it has gained. As such, Poland served as an interesting context to study these associations. Future research would do well to examine the generalizability of the effects in other contexts.

As we outlined in the introduction, there may be different explanations behind the observed pattern of results. To put it in a nutshell, the observed pattern may be due to the image management concerns associated with collective narcissism, but also due to perceived nation's impregnability, or due to the appeal of populist elite cues to those high in national narcissism. Future research should disentangle these three theoretical mechanisms, especially because they might suggest different ways of counteracting anti-vaccination attitudes.

If these effects are driven by top-down populist cues, mimicking the style of populist communication (Jagers & Walgrave, 2007) in pro-vaccination messages may be one way of counteracting the appeal of anti-vaccination movement. This may be achieved either through

appealing to motives characteristic for populism such as emphasizing the central position of the people, criticizing the elites (e.g. for not taking enough care of people's health), or proclaiming a serious crisis (e.g. Rooduijn, 2014). If perceived group invulnerability explains the effect of national narcissism on anti-vaccination attitudes, it would be tempting to put more emphasis on the seriousness of the threat to counteract these attitudes. However, if maintaining an image of being strong and independent is indeed the core motive behind anti-vaccination attitudes, then stronger pressures from global health organizations or authorities might backfire and increase the effect of national narcissism on support for anti-vaccination policies. In contrast, a so-called Jiu Jitsu approach (Hornsey & Fielding, 2017), relying on more complex social interventions aimed to satisfy the underlying needs through individual enhancement and self-affirmation, may prove more effective. We hope that future studies will be able to build on our findings to test these possibilities in the effort to combat anti-vaccination attitudes, as well as anti-science attitudes more broadly.

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