Autonomy supportive and reactance supportive inoculations both boost resistance to propaganda, as mediated by state autonomy but not state reactance

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ABSTRACT
We tested two counter-propaganda strategies for boosting peoples’ resistance to extremist propaganda, one based on Self-Determination Theory and one based on Psychological Reactance theory. Caucasian mTurk worker participants (N = 387) were told they would read extremist messages and were randomly assigned to either a neutral control condition, an autonomy-supportive inoculation condition (‘it is your choice to agree or not’), or a reactance-supportive inoculation condition (‘don’t let them manipulate you’). They then read and rated their agreement with two anti-immigrant extremist messages. Both inoculations produced lower agreement with the extremist messages, compared to the control condition. These effects were independent of participants’ political conservatism and trait reactance, although these person variables were both associated with message agreement. Both the autonomy-support and reactance-support effects were mediated by felt autonomy need-satisfaction, but not by state reactance. Ironically, telling participants that they are free to accept extremist claims may help them to resist such claims.

The dangers posed to society by extremist groups are undeniable (MacFarquhar & Goldman, 2020). This danger is amplified by the fact that certain nations hostile to the United States have been supporting right wing extremism through state sponsored propaganda aiding these group’s recruitment efforts (Flock, 2018). There is a link between propaganda and extremist recruitment, and furthermore, the advent of new communication technologies like social media is empowering propagandists in unprecedented ways (Wilbur, 2017). Propaganda is best defined as the ‘deliberate, systematic attempt to shape perceptions, manipulate cognitions, and direct behavior to achieve a response that furthers the desired intent of the propagandist’ (Jowett & O’Donnell, 2015, p. 7). Countering propaganda is clearly an important task if society is to reduce and mitigate the dangers posed by extremist groups. Despite the severity of the threat, not many reliable and scientifically based counter-propaganda methodologies exist.

Ćosić et al. (2018) have proposed that positive psychology principles might be leveraged on a mass scale, to counteract the effects of extremist propaganda upon vulnerable populations. However, they did not specify what such principles might be,
or how to leverage them. In this research, we followed Ćosić et al.’s (2018) suggestion by creating anti-propaganda inoculations based on the Self-determination theory (SDT) principle of autonomy support. SDT is a prototypical positive psychology theory, and its concept of autonomy support has already been shown to be a simple but powerful principle for influencing other people (Ryan & Deci, 2017; Sheldon et al., 2003). We will further explicate SDT in a later section, after first describing the two dominant theories in the counter-propaganda literature, namely, inoculation theory and psychological reactance theory. Although these theories have had many successes, they also have important limitations. Consistent with SDT, we’ll suggest that any persuasive message will be better received if it is delivered in an autonomy-supportive way Perhaps paradoxically, offering the reader the freedom to reject a counter-propaganda message and accept the propaganda may make him or her less likely to accept the counter-propaganda message.

**Attitude inoculation theory**

Attitude Inoculation theory was developed by William McGuire in 1961, using the analogy to how physical vaccines inoculate people against pathogens. In the same way that a physical inoculation (i.e., a vaccine) exposes the person to a weak version of a virus to train their immune system to defeat a stronger version of the virus that may be confronted later, psychological inoculation exposes people to negative (counter-attitudinal) material while also showing them how to resist such attacks, training their psychological immune system to resist negative persuasion attempts (Compton, 2013).

However, the attitude inoculation approach has important limitations and is difficult to apply on a mass scale. First, it is a multi-step process requiring repeated learning and practice by the recipient over a period of time (Ivanov et al., 2018). Also, attitude inoculations typically are specific to certain types of persuasive appeals already known to exist, requiring re-training as those appeals or other dangers change or evolve. Finally, repeated testing shows that inoculation effects last only two weeks on average (Compton, 2013). Obviously, a flu vaccine that only lasted two weeks would be of limited utility.

Psychological reactance theory (PRT) provides another way of thinking about how to construct counter-propaganda messages. According to PRT people have strong negative reactions when they feel their freedom is being curtailed or threatened (Brehm, 1989). Heavily pressuring propaganda messages are one potential source of felt reactance within people. Thus, a PRT-based counter-propaganda campaign might involve prompting potential propaganda victims to notice and react against the threats to their psychological freedom being made by propaganda messages (Dillard & Shen, 2005). After all, propagandists are trying to ‘hijack’ peoples’ value-systems, causing large changes in their beliefs and behaviors.

However, the PRT approach also has potential limitations. PRT relies on eliciting negative emotions, which are unpleasant and which might cause people to tune out. Also, anti-propaganda strategies based on PRT can have ironic effects (Wegner, 1987), potentially eliciting reactance against the anti-propaganda message which plays into the propagandists’ hands (Dillard & Shen, 2005). Further, research shows that the effects of experimentally elicited reactance are typically short lived, usually less than one hour, even shorter than the effects of attitude inoculation training (Miller et. al., 2103). Also, as with
attitude inoculation programs, psychological reactance is triggered by a very specific type of threat and may be difficult to generalize such that the person gains resistance to many types of stimuli or communications.

**Self-determination theory**

SDT is a meta-theory of human motivation that explores how social, cultural, and intrapersonal conditions support or undermine human development and wellness. The theory assumes that humans are inherently curious, active, and health-seeking, as long as their psychological needs are supported. Perhaps the most important need is to feel autonomous, i.e., to feel that one is the cause of one’s own behavior (Ryan & Deci, 2017). When people feel autonomous, they are enabled to make more optimal choices for themselves and are thus most likely to thrive. Although SDT’s assumption of an inherent need for autonomy is similar to PRT’s assumption that people are inherently resistant to being controlled, SDT’s apparent solution to the problem of social control is different. Rather than trying to increase awareness and induce negative emotions within potential victims of social control, SDT instead tries to support potential victims in making their own choices, assuming that this will help them make healthier choices (Ryan & Deci, 2017). People must ultimately be trusted to choose for themselves, else behavioral change will not persist (Sheldon et al., 2003). For example, Abad and Sheldon (2008) showed that immigrant parents who supported their children’s autonomy to explore the new culture were more likely to rear children who also accepted and internalized the old culture, thereby becoming bi-cultural.

This reasoning suggests that, paradoxically, the best way to inoculate somebody against a negative persuasion message might be to support their autonomy to agree with that message, if they so choose. Doing this might prevent potential victims from developing reactance to the counterpropaganda message and boost their likelihood of rejecting the propaganda itself. Autonomy within SDT is conceived as being open and reflective, which distinguishes it from reactive autonomy as conceived by PRT (Koestner & Losier,). Reactive autonomy involves non-reflective resistance to external control (‘You can’t make me!’) and may occur in the absence of positive feelings of choice and self-determination. In contrast, reflective autonomy is associated feelings of choice and self-determination (‘I hear you, but I will think and decide for myself’). In this study we evaluated whether supporting reflective autonomy is just as impactful as supporting reactive autonomy, for helping readers to resist the appeal of negative persuasive messages.

**Hypotheses**

We tested the following three hypotheses.

1. Autonomy-supportive messaging prior to exposure to propaganda, informing participants that it is their choice whether to accept the propaganda, will boost peoples’ resistance to the propaganda compared to a neutral control condition. Reactance-supportive messaging will also boost resistance compared to a control condition, consistent with past research on the effectiveness of inducing reactance.
2. The above effects will be observed for participants of all political ideologies (conservative vs independent vs liberal) and also for participants both high and low in trait reactance. That is, results will not be moderated by these relevant personality variables. We believed it important to examine this issue because if counter-propaganda inoculations only reduce acceptance of propaganda messages in those who already disagree with those messages, or who are more tolerant, this would considerably limit the potential applicability of those inoculations at a population level. Ideally, the inoculations would also reduce acceptance of the extremist messages even in those who are currently most prone to agree with those messages.

3. Measured feelings of autonomy need-satisfaction after exposure to the anti-propaganda inoculations will mediate the effects of both types of message. Both inoculations should boost participants’ feelings of autonomy in the context, which will in turn help them to reject the negative messages. We also tested whether induced feelings of state reactance would mediate the supportive message effects. This seemed unlikely because if participants feel strong reactance after a reactance-supportive inoculation against propaganda, this may indicate that they have rejected, rather than accepted, the counter-propaganda message, and may thus be more accepting of the propaganda message.

Method

Participants and procedure

Participants were 387 Caucasian mTurk workers, 175 women and 209 men (and 3 ‘other’), who were each paid 1.50 USD for their participation. We screened for Caucasians because of the anti-immigrant theme of the posters to be displayed. Ages ranged from 19 to 81 (M = 38), and most (187) were married compared to 156 never married and 46 widowed, divorced, or separated. The average income was 48,000 USD and the modal education level (N = 179) was ‘Bachelor’s degree in college (4-year)’.

The mTurk advertisement told participants they would provide their opinions on political advertisements. Non-whites were excluded based on their response to a screening ethnicity question. After completing demographic questions and personality scales, participants read one of three messages orienting them to the rest of the study. The neutral control message was designed to ask for honest responses without extra layers of communication. It read: ‘Thank you for answering those preliminary questions! Now, to the main purpose of the study. You are about to read some political advertising messages that are common in the on-line environment today, messages designed to stir peoples’ emotions. Just to be up front, my research is about measuring peoples’ reactions to such messages. Just tell us, as honestly as you can, how they make you feel and how you evaluate them. There are no “right” or “wrong” answers to the questions that will follow the messages. So here is the main point: just give us your first, most unfiltered reactions to the messages you’ll see.’

The autonomy-supportive inoculation was designed to implement, in addition, the three facets of autonomy-supportive communication: Taking the reader’s perspective, offering meaningful rationales for requests, and emphasizing that the reader has choice (Deci et al., ; Sheldon et al., 2003). The statement read: ‘Thank you for participating in
my dissertation research! You are about to read some political advertising messages that may look somewhat appealing to you. I myself sometimes see them this way, since the messages are designed to stir peoples’ emotions. Just to be up front, my research is about helping you to make their own informed choices about the messages. Research shows that people like it when they feel free to do what they choose, and thus, people can be empowered to make their own choices. Of course, you might be just as suspicious about my motivations, as you are about the motivations of the political advertisers – that is perfectly understandable in these confusing times. So here is the main point: be aware that you have the freedom to accept or reject the messages, according to your own values and preferences. I’d like to convince you not to accept the upcoming messages, but I recognize that ultimately it is your choice what to believe or not believe, and I totally respect that. Research shows that if you freely choose to make your own choices, then you will be satisfied with the results of those choices.’

Finally, the reactance support inoculation was designed to emphasize that the propaganda messages threaten the reader’s autonomy, and to urge the reader not to give in. The statement read:

“Thank you for participating in my dissertation research! You are about to read some political advertising messages that may look somewhat appealing to you. I myself sometimes see them this way, since the messages are designed to stir peoples’ emotions. Just to be up front, my research is about helping people to avoid being manipulated by the messages. Research shows that people dislike it when others try to “make” them believe things, and thus, people can be empowered to reject such controlling attempts. Of course, you might be just as suspicious about my motivations, as you are about the motivations of the political advertisers – that is perfectly understandable in these confusing times. So here is the main point: be aware that the following message is trying to control your emotions, and that the author of the message wants you to do things that benefit them. You are being manipulated by the messages’ extremity, in that the author wants to make you feel you have no choice about believing the message. Research shows that if they succeed in indoctrinating you at the beginning, then they will become ever more extreme in their later persuasion attempts.”

After reading one of the three statements and rating their state autonomy and state reactance at that moment, participants read ‘now I am going to show you a political advertisement. I want you to think carefully about what you have just read and analyze the advertisement based on it. Please take your time and really examine the advertisement. I will then ask you some questions about it.’ The posters were created by a graphic designer to specifications. The first poster showed a picture of a sad infant, that read ‘DADDY IS GONE NOW. Every year, thousands of dadas, papas, and daddies are murdered by immigrants. You must protect your family from violent illegals. Call for their imprisonment. Call for their death. Dear Mamas and Papas, join the revolution to take back our country.’ A URL, ‘AmericansForAPureNation.com,’ was also listed. Afterward, participants rated their agreement with the poster.

Next participants read ‘Next I am going to show you another advertisement. Please look at it carefully and give your honest opinion.’ The second poster showed a picture of armed non-Caucasian men, some wearing masks, and read: ‘They’re coming in caravans for our land and our lives. For the safety of our families, for ourselves, for the home of the brave, you must forcefully deport all illegals. There are no excuses for those that threaten
the safety of our country. Join the movement – AmericansForAPureNation.com.’ Afterwards, participants rated their agreement with the poster.

**Measures**

*Political orientation and trait reactance*

Political orientation was measured by asking participants to select ‘which best describes your political orientation?’ The categories of ‘Liberal’ (coded 1, N = 187), ‘Independent’ (coded 2, N = 73), and ‘Conservative’ (coded 3, N = 127) were supplied. We treated this as a categorical measure of conservatism. Trait reactance was also measured. We used a shortened eight-item version of the trait psychological reactance scale (Shen & Dillard, 2005), which had excellent reliability (α = .95).

*State reactance*

State reactance felt after the introductory message was measured by the state reactance scale (Quick & Stephenson, 2007), which has four items (irritated, angry, annoyed, aggravated) measured on a seven-point Likert scale (α = .97).

*State autonomy*

State autonomy felt after the introductory message was measured by the autonomy subscale of the Balanced Measure of Psychological Needs (BMPM; Sheldon & Hilpert, 2012). The abbreviated four item scale contained two positively worded items (‘right now, I feel like I am free to do things my own way’ and ‘right now, I feel like my choices express my true self’) and two negatively worded items (‘right now, I feel like I have a lot of pressures on me’ and ‘right now, I feel like there are people telling me what to do’). We computed an aggregate state autonomy score after reversing the negatively worded items (α = .81).

*Poster acceptance*

The primary method of testing a person’s agreement with a message presented in a communicative text, such as a propaganda poster, is to assess how credible the message was perceived to be. The message credibility scale (Ohanian, 1990) is a widely used measure. It has six items (unbiased, accurate, believable, convincing, tells the whole story, and trustworthy), presented with a seven-point bipolar scale. The lower the participants rate the poster’s credibility the more they reject its message, allowing the effectiveness of the interventions to be estimated. The scale was administered after each poster (α = .98 for Poster 1 and .99 for Poster 2). The two scores were also combined for an aggregate message acceptance variable (α = .96).
Table 1. Means, standard deviations, and inter-correlations of major study variables.

| Variable               | M     | SD    | 1    | 2    | 3    | 4    | 5    | 6    |
|------------------------|-------|-------|------|------|------|------|------|------|
| 1. Conservatism        | 1.84  | .89   |      |      |      |      |      |      |
| 2. Trait Reactance     | 3.01  | 1.46  | -.04 |      |      |      |      |      |
| 3. State Autonomy      | 3.53  | .75   | .04  | -.17 |      |      |      |      |
| 4. State Reactance     | 2.63  | 1.53  | .01  | .50  | -.17 |      |      |      |
| 5. Poster 1 Acceptance | 3.20  | 1.79  | .30  | .29  | -.43 | .33  |      |      |
| 6. Poster 2 Acceptance | 3.03  | 1.87  | .36  | .29  | -.34 | .32  | .78  |      |
| 7. Aggregate Acceptance| 3.11  | 1.73  | .35  | .31  | -.41 | .35  | .94  | .95  |

Note. For correlations ≥ .08, p ≤ .05. For correlations ≥ .13 p ≤ .01.

Results

Table 1 contains descriptive statistics and correlations among major study variables. As expected, trait reactance was associated with the amount of state reactance felt after the experimental manipulation, and trait reactance and conservatism were positively associated with the poster acceptance variables. State autonomy after the introductory statement was negatively associated with poster acceptance. Interestingly, state reactance after the introductory statement was positively associated with poster acceptance. State reactance was also negatively associated with state autonomy. The latter two findings are consistent with the idea that state reactance and state autonomy are quite different, and with the idea that state reactance might increase propaganda acceptance.

Table 2 presents the means relevant to hypothesis 1, which asserted that Autonomy-supportive or reactance supportive messaging prior to exposure to propaganda will boost peoples’ resistance to the propaganda, compared to a neutral control condition. We conducted a separate ANOVA for each of the five dependent measures and found significant omnibus effects of condition upon state autonomy ($F(2,384) = 418.8, p < .001$), poster 1 acceptance ($F(2,384) = 45.2, p < .001$), poster 2 acceptance ($F(2,384) = 20.3, p < .001$), and aggregate poster acceptance ($F(2,384) = 34.9, p < .001$). There was no omnibus condition difference for state reactance, ($F(2,384) = 1.40, p = .25$). Follow-up t-tests showed that both the autonomy-support and the reactance-support conditions differed from the control condition for all variables except state reactance (all $p < .01$). However, the autonomy-support and reactance-support conditions did not differ from one another for any of the variables except state autonomy, which was greater in the autonomy-support condition ($p < .001$).

Hypothesis 2 addressed whether the condition effects upon message acceptance were moderated by political orientation or by trait reactance. Were the inoculations more effective for some people than others? To evaluate the effects of political orientation we
conducted a 3 (Condition: Control vs. autonomy-support vs. reactance support) x 3 (Political orientation: Liberal vs. independent vs. conservative) ANOVA on the aggregate message acceptance variable. There was a significant main effect of political orientation (F(2,384) = 38.05, p < .001), in that conservatives had the highest scores on the aggregate message acceptance variable (M = 3.98), with independents in the middle (M = 2.94) and liberals the lowest (M = 2.60). More importantly, there was no significant interaction between political orientation and condition (p = .42), indicating that the counter-propaganda messages had equivalent effects for liberals, independents, and conservatives.

To evaluate the effects of trait reactance we computed two dummy variables (coded 0 or 1) to represent the autonomy-support and reactance-support conditions, making the control condition the comparison condition. We computed product interaction terms by multiplying the dummy variables times trait reactance. We then conducted a regression analysis predicting the aggregate poster acceptance variable from the two dummy variables, from the (centered) trait reactance variable, and from the two product terms. Supporting the hypothesis, trait reactance did not moderate either of the supportive message effects (both ps > .22), although trait reactance had a significant main effect on aggregate poster acceptance (β = .30, p < .001). These results indicate that whatever the participants’ political or trait reactance orientation, the two counter-propaganda messages had equivalent effects in reducing their acceptance of the propaganda.

Hypothesis 3 posited that state autonomy would mediate the counter-propaganda message effects upon the poster rejection. Because there were no condition effects on state reactance, the mediational role of state reactance did not need to be tested. To examine the mediational role of state autonomy, we first regressed aggregate poster acceptance upon the two condition dummy variables at step 1, then entered state autonomy at step 2 (Baron & Kenny, 1986). In this analysis the autonomy-support condition effect was reduced from −.42 to −.16 at step 2, and the reactance-support condition effect was reduced from −.36 to −.18; state autonomy had an effect of −.28 (p < .001) at step 2.

To formally test Hypothesis 3 we conducted bootstrapped mediation analyses with 5,000 samples (Preacher & Hayes, 2004), testing state autonomy as a mediator of the relationships between the supportive conditions and lower poster acceptance. In the first analysis the direct effect of autonomy-support (controlling for reactance-support) upon poster acceptance was no longer significant with state autonomy in the equation (DE = −.57, SE = .34, LL = −1.24, UL = .11), while the indirect effect via state autonomy was significant (IE = −.95, SE = .29, LL = −1.54, UL = −.41). In the second analysis the direct effect of reactance-support (controlling for autonomy-support) on poster acceptance remained significant with state autonomy in the equation (DE = −.66, SE = .28, LL = −1.21, UL = −.12), but the indirect effect via state autonomy was also significant (IE = −.67, SE = .21, LL = −1.09, UL = −.28). In sum, higher feelings of autonomy after the anti-propaganda inoculations mediated or partially mediated the relationship between the inoculations and lower poster acceptance.

Discussion

This study has yielded promising initial results, with significant theoretical and practical implications. As predicted, both the autonomy support and reactance support conditions
boosted participants’ resistance to extremist propaganda messages, compared to a no message control group (hypothesis 1). Additionally, the effects of the inoculations were independent of participants’ political conservatism or trait psychological reactance (hypothesis 2), although these variables had expected main effects on propaganda acceptance. Also, state autonomy induced by the two support conditions mediated their effects on poster rejection (hypothesis 3). Stated differently, participants felt less autonomous without the supportive messages, and this made them more susceptible to the propaganda. In contrast, state reactance induced by the anti-propaganda messages had no effects on message acceptance. Thus the results indicate that invoking reflective autonomy may be more impactful than invoking reactive autonomy. The current body of SDT literature has only begun to address the question of how people identify and cope with autonomy threats (Ryan & Deci, 2017), and our study offers some evidence that this process might be more significant than previously recognized.

This study could also potentially lay the foundation for new theoretical accounts of persuasion and resistance to persuasion. While SDT would form the backbone of this theory (Sheldon et al., 2003), it would essentially be a communications theory focused on how certain ways or modes of meta-communication serve to make a message more or less effective in the process of persuasion. A similar seeding process was at play with the development of the situational crisis communication theory (Coombs, 2007) when social psychology’s attribution theory was adapted to explain the communication processes involved in crisis communication.

There are also significant practical implications of our study, in that an SDT-based counter-propaganda strategy may provide an effective (and cost effective) tool that can be employed on a large scale. Autonomy-supportive elements could be added to any counter-propaganda persuasion message, acknowledging the messenger’s potential bias and the reader’s freedom to make up their own minds. While this might seem counter-productive on the surface, we suggest that it might help to ‘break the deadlock’ between the two competing messages, making one of the messages more friendly by openly acknowledging that it is, in fact, the reader’s choice whether to accept it. Again, the assumed mechanism at work is that of boosting reflective autonomy, to help a person to engage in critical thinking while reviewing messages that are inherently manipulative. There are also practical implications beyond propaganda, as this method might be used to protect the public from other negative messages, like financial scams and manipulative advertising.

Finally, the current results could inform the development of information-based strategies for combatting serious social problems facing developing nations. Self-determination theory holds that people who live in need-thwarting environments experience more negative life outcomes than those who live in environments that support basic psychological needs (Ryan & Deci, 2017). People living in such need-thwarting environments are likely more susceptible to controlling and manipulative messaging than those in need-supporting environments. For instance, people in third world (compared to first world) countries might be more susceptible to manipulation from criminal groups. It is possible that the development of new SDT based programs to bolster peoples’ reflective autonomy could be even more effective in such contexts.

Our results raise a final intriguing possibility and question: What if propagandists also begin to apply principles of SDT in their messaging, rather than merely trying to induce
anger and reactance in readers? One can imagine an arms race of increasingly subtle manipulative techniques on both sides. As stated earlier, however, SDT is a positive psychology theory that assumes that humans are inherently health- and growth-seeking. If so, then supporting their autonomy should ultimately help them to make the healthiest choices, for themselves and for society, rather than going to extremes. This issue awaits future research.

Limitations

The promising findings of this study must be tempered against a number of limitations. First, this was a single on-line study conducted a single point in time, and the effects remain to be both replicated and shown to be potent in the longer-term. Also, the propaganda involved only anti-immigrant themes, and not other important areas of negative messaging, including extremist left-wing messaging. Finally, the sample came from M-Turk, a source which has generated considerable concern of late (Lovett, Lovett & Simmering). It may be impossible to completely screen out deceptive participants using automated bots or other techniques to game the system (Buchanan & Scofield, 2018). Still, these problems might have the effect of merely weakening, rather than actually biasing, the results. We hope that other researchers will help us explore this issue, using different samples and different kinds of propaganda.

Disclosure statement

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