

Polarization and Emotional Response to Threats: The Case of Covid-19

Pedro Hemsley

Institute of Economics,
Federal University of Rio de Janeiro, Brazil

Flavio Moraes

EBAPE, Getulio Vargas Foundation, Brazil

Lynda Pavão

Department of Economics,
State University of Rio de Janeiro, Brazil

ABSTRACT

In this paper, we ask how polarization is related to innate responses to threats. Through an online survey, we study the relationship between polarization about Covid-19 mitigation measures and psychopathy, a condition characterized by a reduced emotional response to perceived threats. We find that polarization is significantly lower for individuals with high psychopathy traits. This suggests that polarization over emotionally-charged political issues may be related to a biological mechanism that operates in high-risk environments: the fight or flight response.

Keywords: Psychopathy, polarization, Covid-19, fight or flight response, JEL codes: D91, I10

INTRODUCTION

Polarization has become one of the most relevant issues in many societies. Research has identified several of its determinants, including fake news and social media [1, 2], trade exposure [3], and the levels of trust and inequality in a country [4]. In this paper, we ask whether biological factors play a role: specifically, polarization may be related to the fight or flight response, an innate and involuntary physiological reaction to perceived threats.

Fight or flight is characterized by the release of hormones that prepare the body to either confront the threat or escape. These changes are regulated by the brain amygdala and include increased heart rate, heightened senses, and a surge of energy. Responsiveness to threats has been associated to political attitudes [5], and defensive behavior in general is similar between humans and other animals [6].

We consider individuals with a reduced fight or flight impulse: psychopaths. While psychopathy is often stereotyped, it has a well-known feature: reduced activity and size in the brain amygdala, and hence a lower fight-or-flight impulse [7, 8]. We run an online survey with a standard psychological evaluation of psychopathy, and ask participants about their opinions on

Covid-mitigation measures. These are emotionally-charged issues associated to large differences of opinion [2]. We find that, on average, individuals with higher psychopathy traits are significantly less polarized over Covid-related measures. We interpret that polarization may be at least partially related to the fight or flight response.

SURVEY DESIGN AND SAMPLE

We conducted an online survey on September 29, 2022 with 661 participants from the United States. The reward for participation was set at US\$0.75. Respondents were not permitted to participate more than once, and we only accepted workers who had previous experience and had at least a 90 percent approval rating.

The questionnaire design and data collection from respondents were conducted through the Qualtrics platform. To obtain the online sample, we used Amazon's Mechanical Turk (MTurk) platform. The following text was included in the task announcement on MTurk:

"This survey takes around 5 minutes. We will ask questions on a specific subject. Please read them carefully. This survey is completely anonymous, with no collection of personal data. The results will be used only for academic research."

Participants were directed to a link to answer a questionnaire, beginning with a series of socio-demographic questions.

Subsequently, the survey proceeded to a psychological evaluation employing the Levenson Self-Report Psychopathy Scale (LSRPS) developed in Levenson et al. [9]. The LSRPS is designed to measure psychopathy traits within non-forensic samples. The scale includes a succinct set of 26 items, structured to assess two aspects of psychopathy: the primary psychopathy addresses traits such as manipulation, egocentricity, and a lack of empathy and remorse, while the secondary psychopathy focuses on impulsivity, poor behavioral control, and quick-temperedness. Participants respond to each statement on a four-point Likert scale, from 1 ("strongly disagree") to 4 ("strongly agree"), with certain items reverse-scored to mitigate response biases. Higher scores represent higher values of psychopathy. The LSRPS is known for its robust internal consistency, test-retest reliability, and alignment with established psychopathy theories [10, 11, 9, 12].

Primary psychopathy is considered innate and untreatable, and may or may not be accompanied by secondary psychopathy, which is socially determined and treatable.¹ While our results do not depend on the choice of psychopathy type, we use the primary score as our explanatory variable since "amygdala dysfunction is revealed in primary psychopathy in the face of danger or when affective empathy is requested" (Van Honk and Schutter) [13]. Primary psychopathy is biologically determined and is characterized by emotional hypo-activity and low anxiety, which are not observed in secondary psychopathy.²

¹ Correlation between primary and secondary scores was 0.77 in our sample.

² Secondary psychopaths may have high anxiety [14]. Van Honk and Schutter [13] question whether secondary psychopathy should be classified as psychopathy, or as some other anti-social personality disorder.

Then all respondents rated their agreement or disagreement about the following statements on a scale from -8 to 8.³

1. Social distancing has been a relevant measure to limit the spread of COVID-19, especially at the peak of the pandemic.
2. Wearing masks has been a relevant measure to limit the spread of COVID-19, especially at the peak of the pandemic.
3. Ivermectin and Hydroxychloroquine are not effective treatments against COVID-19.
4. Vaccines are highly effective to avoid infection and the development of severe symptoms of COVID-19.

The appendix presents the complete questionnaires.

We denote by Y_{ij} the response of participant i to statement $j = 1, \dots, 4$. Excluding participants who failed the verification questions or otherwise did not conclude the questionnaire, our final sample consists of 645 subjects, with the following characteristics:

Table 1: Summary Statistics

Panel A		
Variables	Mean	SD
Y1	4.62	4.10
Y2	4.35	4.61
Y3	3.54	4.65
Y4	4.01	4.61
Primary Psychopathy Score	32.96	10.54
Secondary Psychopathy Score	20.72	6.80
Political Position	0.66	5.07
Panel B		
Gender	(%)	
Female	45.0	
Male	54.1	
Other/Prefer not to answer	0.9	
Age		
29 or Less	18.4	
30 to 39	39.2	
40 to 49	22.9	
50 or more	19.4	
Education		
Incomplete High School or Less	0.8	
High School Graduate	11.9	
College with no degree	16.6	
Bachelor's Degree	53.6	
Graduate Degrees	14.3	
Other/Prefer not to answer	2.8	
Employment Status		

³ More precisely, we had a broader experiment that included randomized treatments for related issues. For brevity, we skip their description here and present them only in the appendix. Results are unchanged if we restrict the sample to untreated participants – that is, those who underwent the survey exactly as described in the main text.

Employed	87.9	
Retired	1.9	
Student	0.5	
Unemployed	3.4	
Not Formally Employed	2.8	
Other/Prefer not to answer	3.6	
Observations	645	

RESULTS AND DISCUSSION

We run the following regression:

$$|Y_{ij} - \mu_j| = \beta_0 + \beta_1 \cdot Score_i + X_i \cdot \gamma + \varepsilon_i$$

In which:

- $|Y_{ij} - \mu_j|$ is the absolute value of the deviation of the response of subject i to question $j = 1, 2, 3, 4$ to the average response μ_j of all participants to that question.⁴ This is our measure of polarization for subject i .
- $Score_i$ is the primary psychopathy score of individual i .^{5,6}
- X_i is a vector of controls for individual i : gender, age, education, employment status, and political position.
- ε_i is an idiosyncratic error.

Table 2 presents the results.

Table 2: The Effect of Psychopathy on Polarization

	Dependent variable:							
	$ Y_1 - \mu_1 $		$ Y_2 - \mu_2 $		$ Y_3 - \mu_3 $		$ Y_4 - \mu_4 $	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Score	-0.024***	-0.027***	-0.022***	-0.023***	-0.021***	-0.021***	-0.022***	-0.022***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	645	645	645	645	645	645	645	645
R ²	0.060	0.121	0.065	0.120	0.074	0.115	0.069	0.117

Notes: Robust standard errors in parentheses. *, ** and *** denote statistical significance at, respectively, the 10%, 5% and 1% levels.

The estimated coefficient of *Score* is negative and significant in all specifications: on average, subjects with higher psychopathy traits are less polarized as their responses are closer to the average. Point estimates are nearly unchanged when controls are included. As discussed, this may be related to the fight or flight response regulated by the brain amygdala. Overall, the amygdala does not fully distinguish between low and high-risk environments [15]: it trades a

⁴ Results are unchanged if we use the median instead of the average.

⁵ Using $Score_i$ directly is in line with the literature that treats psychopathy as a continuous variable [16, 17]. An alternative is to consider a threshold for psychopathy: an individual is considered a psychopath if their total score is above some level, as in Osumi and Ohira [18]. Our results are unchanged when we follow this procedure.

⁶ Results are unchanged if we use the total psychopathy score.

precise evaluation of threats for an intense fight-or-flight response as this is more relevant for survival in high-risk situations. When risk is low, there may be an overreaction, leading to defensive behaviors, which are mostly automatic. This may be the case, for example, in political debates, a form of conflict that typically does not involve threats to life. Hence psychopathy poses a tradeoff. It is characterized by lower empathy, which may lead to less pro-social behavior, but is associated to a reduced response to perceived risk, which may be useful in a low-risk environment as it allows for more deliberate reasoning – leading in particular to less polarization in issues subject to political debate.^{7,8}

CONCLUDING REMARKS

Our results suggest that individuals with higher psychopathy traits exhibit lower levels of polarization over COVID-19 mitigation measures. This indicates that polarization may be at least partially related to biological factors such as the fight or flight response.

References

- [1]. Azzimonti, M., and M. Fernandes (2023) "Social Media Networks, Fake News, and Polarization" *European Journal of Political Economy* 76, 102256.
- [2]. Allcott, H., L. Boxell, J. Conway, M. Gentzkow, M. Thaler, and D. Yang (2020) "Polarization and Public Health: Partisan Differences in Social Distancing During the Coronavirus Pandemic" *Journal of Public Economics* 191, 104254.
- [3]. Autor, D., D. Dorn, G. Hanson, and K. Majlesi (2020) "Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure" *American Economic Review* 110 (10), 3139-3183.
- [4]. Grechyna, D. (2016) "On the determinants of political polarization" *Economics Letters* 144, 10-14.
- [5]. Oxley, D. R., K. B. Smith, J. R. Alford, M. V. Hibbing, J. L. Miller, M. Scalora, P. T. Hatemi, and J. R. Hibbing (2008) "Political attitudes vary with physiological traits" *Science* 321(5896), 1667-1670.
- [6]. Blanchard, D. C., A. L. Hynd, K. A. Minke, T. Minemoto, and R. J. Blanchard (2001) "Human defensive behaviors to threat scenarios show parallels to fear-and anxiety-related defense patterns of non-human mammals" *Neuroscience & Biobehavioral Reviews* 25(7-8), 761-770.
- [7]. Fanti, K. A., K. Konikou, M. Cohn, A. Popma, and I. A. Brazil (2020) "Amygdala functioning during threat acquisition and extinction differentiates antisocial subtypes" *Journal of Neuropsychology* 14(2), 226-241.
- [8]. LeDoux, J. (2003) "The emotional brain, fear, and the amygdala" *Cellular and Molecular Neurobiology* 23, 727-738.
- [9]. Levenson, M. R., K. A. Kiehl, and C. M. Fitzpatrick (1995) "Assessing psychopathic attributes in a noninstitutionalized population" *Journal of Personality and Social Psychology* 68, 151-158.
- [10]. Brinkley, C. A., W. A. Schmitt, S. S. Smith, and J. P. Newman (2001) "Construct validation of a self-report psychopathy scale: does Levenson's self-report psychopathy scale measure the same constructs as Hare's psychopathy checklist-revised?" *Personality and Individual Differences* 31, 1021-1038.

⁷ The prevalence of psychopathic traits among violent criminals is higher than in the overall population [19].

⁸ Baron-Cohen [20] discusses a similar tradeoff for autism.

- [11]. Lynam, D. R., S. Whiteside, and S. Jones (1999) "Self-reported psychopathy: A validation study" *Journal of Personality Assessment* 73, 110-132.
- [12]. Hare, R. D. (1991) "The Hare Psychopathy Checklist-Revised" Toronto, Ontario: Multi-Health Systems
- [13]. Van Honk, J., and D. J. L. G Schutter (2006) "Unmasking feigned sanity: A neurobiological model of emotion processing in primary psychopathy" *Cognitive Neuropsychiatry* 11(3), 285-306.
- [14]. Kimonis, E. R., N. Goulter, D. J. Hawes, R. R. Wilbur, and M. W. Groer (2017) "Neuroendocrine factors distinguish juvenile psychopathy variants" *Developmental Psychobiology* 59(2), 161-173.
- [15]. LeDoux, J. E. (2000) "Emotion circuits in the brain" *Annual Review of Neuroscience* 23(1), 155-184.
- [16]. Marcus, D. K., S. L. John, and J. F. Edens (2004) "A taxometric analysis of psychopathic personality" *Journal of Abnormal Psychology* 113(4), 626.
- [17]. Haslam, N., E. Holland, and P. Kuppens (2012) "Categories versus dimensions in personality and psychopathology: A quantitative review of taxometric research" *Psychological Medicine* 42(5), 903-920.
- [18]. Osumi, T., and H. Ohira (2010) "The positive side of psychopathy: Emotional detachment in psychopathy and rational decision-making in the ultimatum game" *Personality and Individual Differences* 49(5), 451-456.
- [19]. De Brito, S. A., A. E. Forth, A. R. Baskin-Sommers, I. A. Brazil, E. R. Kimonis, D. Pardini, P. J. Frick, R. J. R. Blair, and E. Viding (2021) "Psychopathy" *Nature Reviews Disease Primers* 7(1), 49.
- [20]. Baron-Cohen, S. (2020) "The pattern seekers: How autism drives human invention" New York: Basic Books.

APPENDIX: COMPLETE QUESTIONNAIRE

Socio-Demographic Questionnaire

1. What is your gender?
 Male
 Female
 Other
 Prefer not to answer
2. What is your age?
 29 or Less
 30-39
 40-49
 50 or more
3. What is your level of education?
 Incomplete High School or Less
 High School Graduate
 College with no degree
 Bachelor's Degree
 Graduate Degrees (Master, PhD, etc)
 Other
 Prefer not to answer
4. What is your employment status?
 Employed

A Student
 Unemployed and seeking work
 Not formally employed and not seeking formal employment
 Retired
 Other
 Prefer not to answer

5. How do you classify yourself in the political spectrum in a scale from -8 to 8?

-8: "Very left wing "

-7

-6

-5

-4

-3

-2

-1

0: "Neutral"

1

2

3

4

5

6

7

8: "Very right wing"

Verification Question

1. This is just a verification statement. What's the capital of the United States?

Canada

Tokyo

Washington DC

Levenson Self-Report Psychopathy Scale

Note (not available for participants during the survey): The primary psychopathy score is composed of items 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 22, 23, 24, 25 and 26 (Items 19, 22, 24, 25 and 26 are reversed). The secondary psychopathy is composed of items 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 (items 6 and 14 are reversed).

How do you feel about the following statements about yourself?

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
1. Success is based on survival of the fittest; I am not concerned about the losers.				
2. I find myself in the same kinds of trouble, time after time.				
3. For me, what's right is whatever I can get away with.				
4. I am often bored.				
5. In today's world, I feel justified in doing anything I can get away with to succeed.				
6. I find that I am able to pursue one goal for a long time.				
7. My main purpose in life is getting as many goodies as I can.				
8. I don't plan anything very far in				

advance.				
9. Making a lot of money is my most important goal.				
10. I quickly lose interest in tasks I start.				
11. I let others worry about higher values; my main concern is with the bottom line.				
12. Most of my problems are due to the fact that other people just don't understand me.				
13. People who are stupid enough to get ripped off usually deserve it.				
14. Before I do anything, I carefully consider the possible consequences.				
15. Looking out for myself is my top priority.				
16. I have been in a lot of shouting matches with other people.				
17. I tell other people what they want to hear so that they will do what I want them to do.				
18. When I get frustrated, I often "let off steam" by blowing my top.				
19. I would be upset if my success came at someone else's expense.				
20. Love is overrated.				
21. I often admire a really clever scam.				
22. I make a point of trying not to hurt others in pursuit of my goals.				
23. I enjoy manipulating other people's feelings.				
24. I feel bad if my words or actions cause someone else to feel emotional pain.				
25. Even if I were trying very hard to sell something, I wouldn't lie about it.				
26. Cheating is not justified because it is unfair to others.				

Objective Information about COVID-19

Note (not available for participants during the survey): This was a treatment, randomly assigned for half of the subjects. This was not presented in the main text for brevity as it does not affect the results (see footnote 3 in text).

The COVID-19 pandemic has affected the lives of people all over the world.

Research indicates that Ivermectin and Hydroxychloroquine are not effective treatments against COVID-19, but there are currently several vaccines that help avoid infection and the development of severe illness.

Moreover, before vaccines became available, social distancing and the use of masks were relevant measures to limit the dissemination of the virus that causes the disease.

Sources: US Food and Drug Administration (FDA) and World Health Organization (WHO)

We will ask you some questions related to the pandemic.

Affect Labeling Questionnaire

Note (not available for participants during the survey): This was a treatment, randomly assigned for half of the subjects. This was not presented in the main text for brevity as it does not affect the results (see footnote 3 in text).
Please answer the following questions about your emotional state.

1. What are your most frequent feelings related to the Covid-19 pandemic? Please choose as many options as you want.

- Anger
- Fear
- Sadness
- Anxiety
- Helplessness
- Neutral
- Other. Please describe in as many details as you want.

2. What are your feelings about the future? Please choose as many options as you want.

- Satisfaction
- Happiness
- Sadness
- Fear
- Apprehension
- Anxiety
- Confidence
- Neutral
- Other. Please describe in as many details as you want.

3. Have you been bothered by feeling down, depressed, or hopeless over the last month?

- 0-Not at all
- 1-Some days
- 2-More than half of the days
- 3- Nearly every day

4. Have you felt helpless at some moment over the last month, either because you were unable to solve some problem on your own, or because you did not have support from others?

- 0-Not at all
- 1-Some days
- 2-More than half of the days
- 3- Nearly every day

5. Please indicate your agreement with the sentence: In most ways my life is close to my ideal.

- 7- Strongly agree
- 6-Agree
- 5-Slightly agree
- 4-Neither agree nor disagree
- 3-Slightly disagree
- 2-Disagree
- 1-Strongly disagree

6. How often have you been upset because of something that happened unexpectedly in the last month?

- 0-Never
- 1-Almost Never
- 2 -Sometimes
- 3-Fairly Often
- 4-Very Often

7. Please indicate how strongly you agree or disagree with the statement: On the whole, I am satisfied with myself.

- 4-Strongly Agree
- 3-Agree
- 2-Disagree
- 1-Strongly Disagree

8. In general, I consider myself:
- 1 – not a very happy person
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7 – a very happy person

Note (not available for participants during the survey): after “Please describe in as many details as you want”, participants had a box to write down any comments.

Verification Question

1. This is just a verification statement. Please choose option 5.
- 1
 - 2
 - 3
 - 4
 - 5

Questions Related to the COVID-19 Pandemic

Please choose for each statement below the option that best describes your opinion about COVID-19.

1. Social distancing has been a relevant measure to limit the spread of COVID-19, especially at the peak of the pandemic.

- 8: “Totally disagree”
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 0: “Neutral”
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8: “Totally agree”

2. Wearing masks has been a relevant measure to limit the spread of COVID-19, especially at the peak of the pandemic.

- 8: “Totally disagree”
- 7
- 6
- 5
- 4
- 3

-2
-1
0: "Neutral"
1
2
3
4
5
6
7
8: "Totally agree"

3. Ivermectin and Hydroxychloroquine are **not** effective treatments against COVID-19.

-8: "Totally disagree"
-7
-6
-5
-4
-3
-2
-1
0: "Neutral"
1
2
3
4
5
6
7
8: "Totally agree"

4. Vaccines are highly effective to avoid infection and the development of severe symptoms of COVID-19.

-8: "Totally disagree"
-7
-6
-5
-4
-3
-2
-1
0: "Neutral"
1
2
3
4
5
6
7
8: "Totally agree"