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THE POWER OF SELF-DECEPTION: PSYCHOLOGICAL REACTION TO THE COVID-19 THREAT

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SUMMARY

Background: Poland's inhabitants have often expressed disbelief and negative attitudes toward social isolation, combined with restlessness. This is due to a tendency to discount troubling information while facing the unknown and counter-argue against information that causes discomfort and fear. This tendency helps humans to maintain hope and well-being. The study aimed to determine if Polish citizens tend to downplay or even deny danger when faced with a death threat.

Material/ Methods: The study comprised 58 adults – 46 females 12 males, aged 21 to 49. The participants were asked to answer 12 questions defining their beliefs and attitudes towards the COVID-19 pandemic threat and its consequences. The subjects gave answers on the 5-point Likert scale, from "definitely not" to "definitely yes".

Results: The findings of the present study show that a considerable number of the participants tend to exhibit an optimistic bias. This is reflected in their direct statements and in the lack of congruence of their opinions. They do feel the threat of becoming ill but also seem to believe it need not affect them personally. They are also relatively optimistic about the outcomes of the pandemic. At the same time, they realize that COVID-19 may lead to severe psychological, neurological, and mental disorders.

Conclusions: The study confirmed a tendency to deny the threat that can pose a severe risk to health and psychological well-being. This is a manifestation of an optimism bias that has its roots in the way the human brain works. The participants did express concerns about the future but at the same time hoped that life after the pandemic would return to normal. It reflects a benevolent facet of self-deception since it makes it possible to cope with highly threatening and impossible to control events.

Key words: optimistic bias, misinformation, data selection, biconceptualism, coping mechanisms

INTRODUCTION

The COVID-19 virus first appeared in December 2019 in the Chinese city of Wuhan. On March 11, 2020, WHO officially declared the pandemic outbreakas a result of the rapid increase in infections outside of China. A state of epidemic was declared in Poland on March 13, 2020. On that day, the Ministry of Health reported 84 cases of infections and two fatalities. The first restrictions were announced, but they were not excessively strong. The recommendation of the Ministry of Health was to limit contacts and take care of hygiene rules, especially in public places. Malls were closed (except for grocery stores, pharmacies, and drugstores), and the operation of restaurants, cafés, clubs, pubs was suspended (with the "take away" or "transport" option still in operation). The state of calling events an epidemic was officially introduced on March 20, 2020. It was associated, among other things, with the suspension of education in educational institutions and schools, restriction in the movement of people, and means of transport. Universities were closed down, and most of them switched to remote operations.

Nevertheless, despite the COVID-19 spread, it remained a rather abstract threat for many people in Poland. They often expressed disbelief and negative attitudes toward social isolation, combined with restlessness. The numbers of infected people, carriers and mortality rates, although frightening, do not refer to the direct experience of all people on a mass scale.

It might be of interest to note that the disbelief in the epidemic remained stable despite the ever-increasing number of infections and death. One of the reasons was fake news spreading on the Internet both in the written form (e.g. on Twitter or Facebook) and video files (e.g., YouTube). Also, quite a number of books claiming the COVID pandemic to be a scam were issued (e.g., Berenson, 2020; Iovine, 2021). Their authors proclaim that lockdown and masks are a tool of government policy aiming at controlling our life. Thence, statistics are deliberately overstated. Moreover, masks are reported to deprive people of oxygen, and all cases of COVID-19 are presented as less harmless than flu and other illnesses. Misinformation is seductive since COVID-19 is unknown, uncertain, and uncontrolled. There is a clear threat to basic needs such as food, shelter, and safety, creating a loss of control. Only after you accept a conspiracy theory does the world again makes sense. In effect, people pass along that fake news to others, causing misinformation to spread rapidly (see Morgan, 2020). Paradoxically, the conspiracy theory has its origin in the Davos meeting of The World Economic Forum, which stressed the need totackle the crisis caused by the pandemic (Michie, 2021). It gave COVID skeptics grounds for the assertion that this group of world leaders orchestrated the pandemic to control the global economy.

A review of articles on COVID disinformation reveals that they are written mainly by journalists and health officials. Hence, they miss a fundamental psychological reason for fake news seductivity, namely, defense mechanisms. Already Freud (1989) posited that we are apt to separate ourselves from unpleasant thoughts and memories. One of them is denial, when we refuse to accept reality

or facts to avoid painful feelings or events. Studies performed by neuroscientists and social psychologists show that it is closely linked to our world view (Dunning & Balcetis, 2013; Mercier & Sperber, 2017; Pąchalska, Kaczmarek & Kropotov, 2014). The world view refers not only to our values and beliefs of how society should function but also the conviction of who we are (Gajewski, 2020; Watts, 2011). As a consequence, we react emotionally to the information that contradicts these beliefs since it threatens our core sense of self (Pąchalska, Góral-Półrola, 2021; Shealy, 2015). Hence, we tend to look for data that confirm our values and beliefs, labeled as the confirmation bias (Haidt, 2012; Kahneman, 2011; Mercier & Sperber, 2017; Wason, 1960). It also results from the limits of our working memory. Thence, a vast number of incoming data are shifted to avoid brain overload (Kaczmarek, 2020; Klingberg, 2009). On the other hand, besides the confirmation bias, people succumb to a disconfirmation bias. Moreover, studies have found that disconfirming information is subjected to skepticism and disbelief (Edwards & Smith, 1996; Watson, 2011; Wyer (2004). At the same time, studies report a strong tendency to overestimate the likelihood of positive future events and underestimate the occurrence of harmful accidents (Eil & Rao, 2011; Harris & Hahn, 2011; Joshi & Carter, 2013; Weinstein, 1980).

Such an optimistic attitude need not be regarded as a weakness since believing that misfortunes will befall others makes life easier. Otherwise, we would be afraid to leave home so as not to be run over by a car, travel, or even dine in a restaurant not to get poisoned.

The optimistic approach might be helpful in emotionally loaded threatening situations, which a pandemic certainly is. Therefore, the present article aimed to assess people's attitudes and opinions concerning the COVID-19 threat. It was assumed that due to a tremendous sense of danger many Polish citizens would tend to downplay or even deny the threat.

MATERIAL AND METHODS

Participants

The study comprised 58 adults (46 females and 12 males, aged 21-49 (M = 31.69, SD = 10.58, Md = 29.5, D = 23), 34 of them were university students and 24 employees of institutions.Twenty-one students were part-time workers. The participation was anonymous, voluntary, and there was no time limit. The permission to conduct the research was given by the University Research Bioethics Committee of the University of Economics and Innovation in Lublin. The study was conducted in accordance with the principles contained in the Helsinki Declaration. All the examined persons confirmed their own good somatic health and that of their nearest and dearest, this lasting for a period of isolation. Table 1 presents the demographic data of the participants.

Table 1. Demographic data of the participants

Characteristics		N (75)	% (100)
Gender	Females	57	76
	Males	18	24
Residence	Big city	52	69.3
	Medium sized city	4	5.3
	Small town	3	4.0
	Village	16	21.3
Status	Employee	29	38.7
	Non-employee	1	1.3
	Working student	21	28.0
	Student	24	32.0
Course of study	Full-time	22	29.3
	Part-time	46	61.3
	Not applicable	7	9.3
Type of work	Healthcare	6	8.0
	Remote work	38	50.7
	Inactive entrepreneur	13	17.3
	Other	18	24.0

Measures and Procedures

Full-time and part-time students were notified electronically about the possibility of taking part in the research. Some of them asked if they could also pass the questionnaire onto their friends, to which they obtained permission. In order to ensure the anonymous character of the research, a double address coding procedure was applied, i.e., the respondents had the opportunity to send the questionnaire from an address other than their own.

The following questions were asked:

- At first, after the announcement of the pandemic, I was relieved to finally be able to slow down a bit, relax, and take it easy.
- I feel psychological discomfort due to prolonged isolation.
- The pandemic will change many people's attitudes to life values.
- The pandemic will affect the future of my generation.
- I am optimistic about the future.
- I don't think the pandemic will have any impact on our lives in the long run. Everything will go back to the way it used to be.
- I feel lost in this situation. I don't want to think about the future.
- I feel no threat in the current state of play. I think we should go back to "normal" life.
- I am better at organizing my work under the current conditions.
- I feel that time is "slipping through my fingers".

Also, the participants were asked to give answers to the two following open questions:

- Which generation, in your opinion, will bear the greatest cost associated with the discomfort of living in the present situation?
- What psychological consequences do you expect as a result of the pandemic?

- The above enabled one to gain a broader picture of the opinions and beliefs of the individuals under study.

RESULTS

Table 2 summarizes the percentages of the respondents' answers to all 12 items of the questionnaire. In order to make the further analysis more readable, the answers "definitely yes and yes" as well as "definitely no and no" have been merged.

The COVID pandemic and its limitations were greeted by 45.3% of the respondents with relief as an opportunity to slow down the pace of life temporarily and to relax, while 49.4 regarded it to be really bad. The remaining 5.3% had no opinion on the matter. At the same time, 54.6% reported discomfort due to isolation, and 70.7% believed that life after the epidemic would not go back to normal. The majority of the surveyed participants (62.6%) considered that the pandemic would change the attitude of many people to the value of life. The opposite opinion was expressed by 20.0% of respondents, and the remaining 22.4% had no opinion. As many as 89.4% of the respondents believed the pandemic would significantly impact the future of their generation. Of different views were only 8%, while 2.7% were not sure. As far as the post-pandemic consequences for mental well-being and health are concerned, only the occurrence of disorientation (66.7%), despondency (65.3%), and depression (64.0%) were rated high.

The possibility of the emergence of other mental disorders did not reach even a level of 50% of probability. These were feelings of loneliness (44.0%), neuroses (38.7%), loss of sense of security (36.0%), aggression (34.7%), indecision (32.0), loss of motivation (25.3%), and falling into addictions (18.7%). Only 34.6% declared that they are better at organizing their work, and only 34.7% felt they were wasting their time. Also, 54.7% reported a feeling of threat and believed that everything would not go back to normal.

Despite the above-enumerated problems, 38.7% of the respondents remained optimistic about the future, and only 18.7% were not, while 21.3% had no opinion

Table 2. The percentages of the respondents' answers to thetwelve items of the questionnaire

Item No	Definitely yes	Yes	No	Definitely no	I don't know
1	10.3	37.9	34.5	12.1	5.2
2	32.8	25.9	15.5	17.2	8.6
3	19.0	46.6	12.1	0	22.4
4	22.4	70.7	6.9	0	0
5	22.4	32.8	20.7	0	24.1
6	6.9	1.7	67.2	10.3	13.8
7	8.6	10.3	55.2	22.4	3.4
8	0	6.9	44.8	36.2	12.1
9	17.2	8.6	41.4	10.3	22.4
10	17.2	17.2	25.9	10.3	29.3
I	Children	Youth	Young adults	Middle adulthood	Late adulthood
	3.4	22.4	39.7	17.2	17.2
II	27.6	72.4	0	0	0

on the subject. Even though 62.7% of participants believed that pandemics would affect their life, 70.7% stated that they do not feel lost and do not run away from making plans for the future. Some voluntarily expressed their belief that the necessity to stay at home would result in making families become closer and to feel respect for the feelings and needs of others.

DISCUSSION

The findings of the present study show that a considerable number of the participants tend to exhibit an optimistic bias. This is reflected not only in their direct statements but also in the lack of congruence of their opinions. They do feel the threat of becoming ill but seem to believe that it need not affect them personally. Even though they report psychological discomfort, many of them state that the lockdown enabled them to slow down and rest. They were also rather optimistic about the outcomes of the pandemic. At the same time, they realize that the COVID-19 may lead to severe psychological and medical consequences. Admittedly, many reports are describing the neuropsychological and mental disorders that emerged as a result of the pandemic (Aknin et al., 2021; Canetta et al., 2014; Coughlin, 2012; Kępińska et al., 2020; McGrath, Pemberton, Welham, & Murray, 1994; Menninger, 1919a, 1999b, 1920; Parboosing, Bao, Shen, Schaefer & Brown, 2013; Selten & Termorshuizen, 2017 and the articles in this issue) but they have appeared in scientific papers and, hence, they are beyond the awareness of the lay public. Vedantamand & Mesler (2011) argue that optimistic self-deception must not be a sign of weakness but may be a benevolent and adaptive response to difficult circumstances. It gives people hope instead of despair and is, therefore, essential for survival. As they put it, individuals: "confronted by immense pain – might choose the hope of lies over the despair of truth (Vedantam & Mesler, 2021).

It certainly is one of the helpful coping mechanisms closely linked to the work of the emotional brain filter (Kaczmarek & Markiewicz, 2018). It makes it possible to sift the positive information from the negative. Concentration on the positive aspects of a given situation stimulates the reward system (Pąchalska, 2019; Pąchalska, Kaczmarek, & Kropotov, 2014). This leads to a reinforcement of the tendency to self-deception because it enables a sense of well-being. Even if the above-mentioned type of self-deception does not eliminate the source of distress, it might make it less of a burden and maintainan optimistic worldview. Shealy (2015) argues our version of reality is closely linkedto the self and that optimists not only live a better life but also live longer. Disastrous effects of the loss of hope upon the self can be observed in brain-damaged patients (see Pąchalska, Kaczmarek, & Kropotov, 2021). Therapy aimed at regaining a sense of life and changing one's world view has proved effective.

A very instructive example is the successful therapy of an artist who, owing to recovering the ability to create paintings, regained her lost self (Pąchalska, Bednarek & Kaczmarek 2021). She was infected by SARS-COV-2 confirmed by

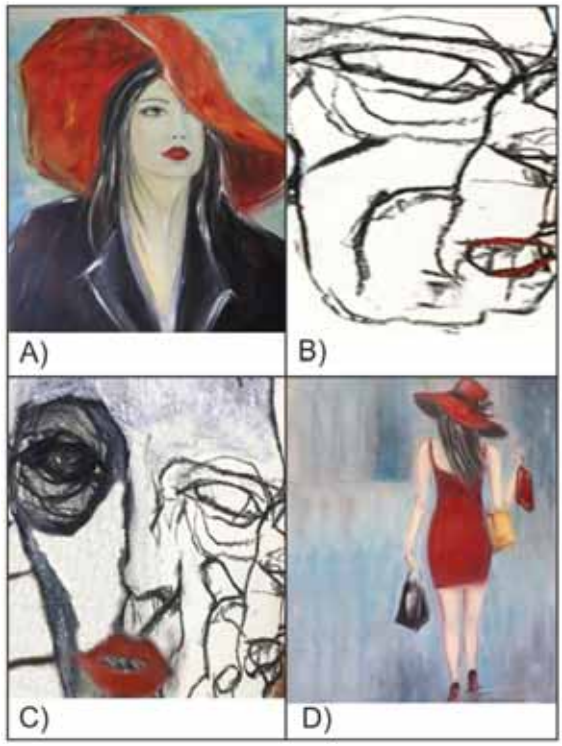

Fig. 1. Self-portraits: A) Woman-1, before illness; B) Woman-2, one month after illness; C) Woman-3, three months after illness, and before therapy; D) Woman-4 "Alienation" after two months of therapy
Source: Clinical material of M. Pąchalska

genetic RT-PCR test (positive, GEN orflab and GEN E detected), developed neuroCOVID-19 and suffered a stroke of the right cerebral hemisphere with a lesion in the fusiform gyrus. After a 4-week stay in an intensive care unit and after returning home, she suffered from cognitive disorders (selectivity and concentration of attention, working memory, and prosopagnosia). She could not paint faces, which had previously been her favorite topics (cf. Fig. 1. A).This can be noted in her early self-portraits made after the illness (cf. Fig. 1. B. C) in which distortions and the loss of facial likeness can be seen. She was administered a Symbolic Art Therapy Program (Pąchalska & Góral-Półrola, 2021) and after two months of this treatment she found a way to continue painting, but all the figures she paints are presented backwards so that the face is not visible.

Recently she has exhibited these new paintings on the walls of Krakow and sold a few of them. It means that now she is able to earn money and support herself and her disabled daughter. In this way she was able to regain her own Self. However, the analysis of her path to success, reveals a strong mechanism of self-deception (fear and optimism) that finally allowed her to survive the tragedy of her life.

It is worth noting that most participants of the present study also expressed self-deception reflected in high optimism and fear, that is, in two opposites. This

is a manifestation of biconceptualism, which is so frequently observed in human reasoning. Lakoff (2014, p. XIV) offers a twofold explanation for this inconsistency of how the brain works:

1. mutual inhibition (when one system is turned on the other is turned off);
2. neural binding to different issues (when each system operates on different concerns).

As mentioned earlier, this is related to the phenomenon of an optimism bias and selective attention towards positive information leading to an inclination to expect positive events in the future. Neurophysiological data suggest that the frontal cortex plays a crucial role in such selective updating (O'Sullivan & Owen, 2015; Steimer, 2002; Tovote, Fadok, & Lüthi, 2015). Other significant areas are the amygdala and the rostral anterior cingulate cortex, which together form the neural circuit crucial for remembering the past and imagining the future (Addis, Wong, & Schacter, 2007; Sharot, Guitart-Masip, Korn, Chowdhury, & Dolan, 2012; Sharot, Riccardi, Raio, & Phelps, 2007).

CONCLUSIONS

The study confirmed a tendency to deny any threat that can pose a severe risk to health and psychological well-being. This is a manifestation of an optimism bias that has its roots in the way the human brain works. Consequently, people tend to overestimate the occurrence of future positive events even when faced with evidence of adverse outcomes. Yet this does not mean that they do not see the dangers. Accordingly, the participants of the present study did express concerns about the future but at the same time hoped that life after the pandemic is over will return to normal. Some evenbelieved that it would strengthen family ties. It seems that in this case, self-deception is one of the mechanisms making it possible to cope with highly threatening and impossible to control events.

REFERENCES

Addis D.R., Wong A.T., & Schacter D.L. (2007). Remembering the past and imagining the future: common and distinct neural substrates during event construction and elaboration. *Neuropsychologia,* 45, 1363–1377.

Aknin, L.B., De Neve, J.E., Dunn, E.W., Fancourt, D.E., Goldberg, E., Helliwell, J.F., Jones, S.P., Karam, E., Layard, R., Lyubomirsky, S., Rzepa, A., Saxena, S., Thornton, E.M., Vander,Weele, T.J, Whillans, A. V., Zaki, J., Caman, O.K. & Amor, Y.B. (2021). The Neurological Consequences of Contracting COVID-19. The Lancet's COVID-19 Commission Mental Health Task Force. *Acta Neuropsychologica*,*19* (3), 301-305.

Bental, E. (1958). Acute psychoses due to encephalitis following Asian influenza. *Lancet*, 2, 18-20. doi: 10.1016/S0140-6736(58.90005-9

Berenson, A. (2020). *Unreported Truths about COVID-19 and Lockdowns: Part 1:Introduction and Death Counts and Estimates*. New York: Alex Berenson

Canetta, S.E., Bao, Y., Co, M.D., Ennis, F.A., Cruz, J., Terajima, M., Shen, L., Kellendonk, C., Schaefer, C.A., & Brown, A.S. (2014). Serological documentation of maternal influenza exposure and bipolar disorder in adult offspring. *The American Journal of Psychiatry*, 171(5), 557–563. https://doi.org/10.1176/appi.ajp.2013.13070943

Coughlin, S.S. (2012). Anxiety and depression: Linkages with viral diseases. *Public Health Reviews*, 34(2), 7. doi: 10.1007/BF03391675

Dunning, D., & Balcetis, E. (2013). Wishful seeing: How preferences shape visual perception. *Current Directions in Psychological Science*, 22(1), 33-37. https://doi.org/10.1177/0963721412463693

Edwards, K., & Smith, E. E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of Personality and Social Psychology, 71*(1), 5–24, https://doi.org/10.1037/0022-3514.71.1.5

Eil, D., & Rao J.M. (2011). The good news-bad news effect: Asymmetric processing of objective information about yourself. *American Economic Journal: Microeconomics*, 3 (2), 114-38.

Freud, S. (1989). *An outline of psycho-analysis*. London, UK: W. W. Norton & Company.

Gajewski, M. (2020). Pedagogical, neuropsychological and social conditions of shaping the identity of cult group followers. *Acta Neuropsychologica*, 18(2), 233-258.

Haidt, J. (2012). *The Righteous Mind: Why Good People Are Divided by Politics and Religion*. New York: Pantheon.

Harris, A.J., & Hahn, U. (2011). Unrealistic optimism about future life events: a cautionary note. *Psychology Review*, 118(1), 135-54. doi: 10.1037/a0020997. PMID: 21058872.

Iovine, J. (2021). *Scamdemic – the COVID-19 agenda: the liberal's plot to win the white house*. Staten Island, NY:Images Si Inc.

Joshi, M. S., & Carter, W. (2013). Unrealistic optimism: East and west? *Frontiers in Psychology, 4,* Article 6. https://doi.org/10.3389/fpsyg.2013.00006

Kaczmarek, B.L.J., & Markiewicz, K. (2018). Current and traditional views on the brain works. *Acta Neuropsychologica*, 16(2), 201-212

Kaczmarek B.L.J. (2020). Current views on neuroplasticity: what is new and what is old? *Acta Neuropsychologica*, 18(1), 1-14.

Kahneman, D. (2011). *Thinking, fast and slow.*New York : Farrar, Straus and Girou.

Kępińska, A.P., Iyegbe, C.O., Vernon, A.C., Yolken, R., Murray, R.M., & Pollak, T.A. (2020). Schizophrenia and influenza at the centenary of the 1918-1919 Spanish influenza pandemic: Mechanisms of psychosis risk. *Frontiers in Psychiatry*, 11-72, https://doi.org/10.3389/fpsyt.2020.00072

Klingberg, T. (2009). *The overflowing brain: Information overload and the limits of working memory.*Oxford UK: Oxford University Press.

Lakoff, G. (2014).*The ALL NEW don't think of an elephant!* White River Junction, VT: Chelsea Green Publishing.

McGrath, J.J., Pemberton, M. R., Welham, J. L., & Murray, R. M. (1994). Schizophrenia and the influenza epidemics of 1954, 1957 and 1959: A southern hemisphere study. *Schizophrenia Research*, 14(1), 1–8. https://doi.org/10.1016/0920-9964(94.90002-7

Menninger, K.A. (1919a). Psychoses associated with influenza, I: General data: Statistical analysis. *JAMA*, 72(4., 235–241. DOI:10.1001/jama.1919.02610040001001

Menninger, K.A. (1919b). Psychoses associated with influenza, II: Specific data. An expository analysis. *Archives of Neurology and Psychiatry*, 2(3), 291-337. doi:10.1001/archneurpsyc.1919.02180090041004

Menninger, K.A. (1920). Influenza psychoses in successive epidemics. *Archives of Neurology and Psychiatry*, 3, 57-60.

Mercier, H., & Sperber, D. (2017). *The enigma of reason.* Cambridge MA: Harvard University Press.

Michie J. (2021). Davos 2021: to achieve a 'great reset', we can't count on the same old globalists to lead the way. *The Conversation*, January 22. https://theconversation.com/davos2021.

Morgan M. (2020). The two pandemics – covid and lies. *BMJ*371 :m4516. doi: https://doi.org/10.1136/bmj.m4516

O'Sullivan, & Owen P. (2015). The neural basis of always looking on the bright side. *Dialogues in Philosophy, Mental and Neuro Sciences*, 8(1), 11–15.

Pąchalska, M. (2019). Integrated self system: a microgenetic approach. *Acta Neuropsychologica* 17(4), 349-393.

Pąchalska, M., Bednarek S., & Kaczmarek B.L.J. (2021) Mózg, umysł i Ja kulturowe. Kraków: Wydawnictwo IMPULS.

Pąchalska, M., & Góral-Półrola, J. (2021). Visual art in aphasia therapy: the lost and found self. *Acta Neuropsychologica*, 18(2), 149-181.

Pąchalska M., Kaczmarek B.L.J., & Kropotov J. (2014). *Neuropsychologia kliniczna. Od teorii do praktyki* [Clinicalp sychology. From theory to practice]. Warszawa: Wydawnictwo Naukowe PWN.

Pąchalska M., Kaczmarek B.L.J., & Kropotov J. (2021). *Ja utracone i odzyskane* [The lost and regained self]. Kraków: Wydawnictwo: IMPULS.

Parboosing, R., Bao, Y., Shen, L., Schaefer, C.A., & Brown, A.S. (2013). Gestational influenza and bipolar disorder in adult offspring. *JAMA Psychiatry*, 70(7), 677–685. doi:10.1001/jamapsychiatry.2013.896

Shealy, C. N. (2015). *Making sense of beliefs and values*. Springer Publishing Company. Kindle Edition.

Selten, J.P., & Termorshuizen, F. (2017). The serological evidence for maternal influenza as risk factor for psychosis in offspring is insufficient: critical review and meta-analysis. *Schizophrenia Research*, 183(2-9). https://doi.org/10.1016/j.schres.2016.11.006

Sharot T, Guitart-Masip M, Korn CW, Chowdhury R, & Dolan RJ. (2012). How dopamine enhances an optimism bias in humans. *Current Biology*, 22, 1477-1481.

Sharot T, Riccardi AM, Raio CM, & Phelps EA. (2007). Neural mechanisms mediating optimism bias. *Nature*, 450:102-105.

Steimer, T. (2002). The biology of fear- and anxiety-related behaviors. *Dialogues in Clinical Neurosciences*, 3(4), 231-249.

Tovote, P., Fadok, J.P., & Lüthi, A. (2015). Neuronal circuits for fear and anxiety. *Nature Reviews Neuroscience*, 16(6), 317-31. doi:10.1038/nrn3945

Vedantam, S., & Mesler, B. (2021). *Useful delusions: The power and paradox of the self-deceiving brain.*New York: W. W. Norton & Company.

Wason P.C. (1960). On the failure to eliminate hypothesis in a conceptual task. *Quarterly Journal of Experimental Psychology*, 12, 129-140.

Watson R. (2011). European parliament criticises H1N1 pandemic response. *BMJ* 342 :d1639. doi: https://doi.org/10.1136/bmj.d1639

Watts, D. J. (2011). *Everything is obvious.* New York: Crown.

Weinstein, N.D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39, 806–820.

Vedantam, S., & Mesler, B. (2021). *Useful delusions: The power and paradox of the self-deceiving brain.* New York: Norton & Company.

Wyer, N. A. (2004). Not all stereotypic biases are created equal: Evidence for a stereotype-disconfirming bias. *Personality and Social Psychology Bulletin*, 30*,* 706-720. https://doi.org/10.1177/0146167203262850

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